

THE  
VETERINARY BULLETIN

Vol. 29]

February, 1959

[No. 2

## DISEASES CAUSED BY BACTERIA AND FUNGI

SETO, J. T. & WILSON, J. B. (1958). **Bacteriophage typing of micrococci of bovine origin.** —*Amer. J. vet. Res.* **19**, 241-246. 299

93% of 379 coagulase-positive, bovine mastitis staphylococci were typed using seven phages (42D, a new phage, 53, and five phages derived from these two by adaptation to bovine staphylococci). Twelve phage types and patterns were defined. Cultures of the same phage pattern from three different herds were shown by lysogenicity tests to be different. The results were compared with those obtained using phages of the international series.—IAN DAVIDSON.

SLOT, P. A. (1958). *Streptococcus uberis*, klassifikation, systematik og forekomst. [Classification and occurrence of *Str. uberis*.] —*Nord. VetMed.* **10**, 143-152. [In Danish. Summaries in English and German.] 300

S. studied the cultural and biochemical properties of 156 strains isolated from milk, and discussed the classification of the organism in relation to the 4 groups of Sherman (1937). 4 strains of the organism were isolated from 119 faeces samples from cows and calves.—R.M.

BRATLIE, O. (1958). Betydningen av vakuumbøydning i mjølkemaskinene for mjølketeknikk og jurhygiene. [Importance of degree of vacuum in the milking machine for milking technique and udder hygiene.] —*Nord. VetMed.* **10**, 128-142. [In Norwegian. Summaries in English and German.] 301

A vacuum of 50 cm. Hg resulted in greater flow of milk and slightly more rapid emptying of the udder than a vacuum of 35 cm. Hg, but did more damage to the teats and teat canal and increased the incidence of staphylococcal mastitis.—R.M.

BATYUK, I. F. (1958). [Virulence and immunogenic properties of cultures of anthrax bacilli incubated at 45°C. II.]—*J. Microbiol.*

*Moscow* **29**, No. 8 pp. 101-105. [In Russian.] 302

The virulence of anthrax bacilli cultured in broth at 45°C. was intermediate between that of the first and second vaccines of Tsenkovskii. The method was recommended as being suitable for preparation of anthrax vaccines.—R.M.

FISHBEIN, V. Y. (1957). [Seasonal variations in the reactivity of cattle to tuberculin.] —*Bull. nauchno-tekh. Informatsii, Leningrad. nauchno-issled. vet. Inst.* No. 3. pp. 5-7. [Abst. in *Veterinariya, Moscow* **35**, No. 8. pp. 55-56. (1958).] 303

Cows with tuberculosis that were doubtful or negative to tuberculin tests in March and April were mostly positive in summer. In September reactions weakened again. Weak reactions were associated with increased food consumption. It is concluded that these seasonal variations are related to changes in metabolism.—M.G.G.

VILLEGAS DELGADO, M. (1958). Estudios previos sobre anergia tuberculínica en bovinos de Venezuela. [Failure to react to tuberculin in cattle in Venezuela.] —*Rev. vet. venez.* **5**, No. 24. pp. 3-12. [Summary in English.] 304

42 cows which failed to react to the single i/d tuberculin test were examined pathologically and bacteriologically. TB. was found in 22 of them. Such animals constituted foci of infection in herds otherwise free from TB.—R.M.

PARAF, A. & ASSO, J. (1958). Sur la mise en évidence de la tuberculose par le BCG-test chez les bovins tuberculeux rendus anergiques par injections répétées de tuberculine. [Intra-dermal BCG reaction for detecting tuberculous cattle which fail to react to tuberculin.] —*Bull. Acad. vét. Fr.* **31**, 183-188. 305

18 cattle which reacted to the ordinary i/d tuberculin test were rendered insensitive by from 1 to 3 s/c inj. each of 20 ml. tuberculin. Ten



days later 0.2 ml. of a suspension of BCG was inj. i/d. After another 4 days the cattle were killed and examined for lesions. Although BCG detected TB. in desensitized cattle, it had the disadvantage of making infected and uninfected cattle react to tuberculin for at least 2 months.

—R.M.

PATERSON, A. B., STUART, P., LESSLIE, I. W. & LEECH, F. B. (1958). **The use of tests on slaughterhouse cattle for estimating relative potencies of tuberculins and for the calculation of discrimination tests.**—*J. Hyg., Camb.* **56**, 1-18. **306**

Four different mammalian P.P.D. tuberculins were compared in i/d tests on 160 cattle, which were slaughtered after the tests. Potency of tuberculin from a bovine strain was high when it was grown on Watson-Reid medium and low when the B.A.I. medium of Dorset [*V.B.* **4**, p. 641] was used. Differences in the ability of the tuberculins to detect infected animals were due to differences in potency. Optimum concentration of avian tuberculin for use in comparative tests was 0.25 mg./ml. Tuberculin prepared from bovine strains was not superior to that from human strains.—R.M.

TAKAHASHI, Y. & YAMAMOTO, K. (1958). Sur les constituants bacillaires déterminant l'allergie et l'immunité dans la tuberculose. [**The bacterial constituents which determine allergy and immunity in tuberculosis.**]—*C. R. Soc. Biol., Paris* **152**, 377-380. **307**

Virulent human type tubercle bacilli killed and extracted with acetone or subsequently extracted with chloroform to remove all loosely combined lipids were capable of producing both tuberculin type sensitivity and immunity to tuberculous infection in g.pigs. Further removal of the tightly-bound lipids to complete delipidation, with acidified alcohol removed both the capacity to sensitize to tuberculin and to produce immunity. Similar results were obtained with several human strains and in addition it was shown that the sensitizing factor was destroyed or removed by treatment with sodium hydroxide. The waxes of the bacillus have little effect in producing tuberculin sensitivity or immunity, the active components being probably tightly bound lipo-protein or lipo-poly-saccharide complexes.—A. B. PATERSON.

I. WAKSMAN, B. H. & MATOLTSY, M. (1958). **The effect of tuberculin on peritoneal exudate cells of sensitized guinea pigs in surviving cell culture.**—*J. Immunol.* **81**, 220-234. **308**

II. WAKSMAN, B. H. & MATOLTSY, M. (1958). **Quantitative study of local passive transfer of**

**tuberculin sensitivity with peritoneal exudate cells in the guinea pig.**—*Ibid.* **235-241.** **309**

I. Washed peritoneal exudate cells growing on glass in a simple nutrient medium reacted to antigen (tuberculo-protein) by an accelerated differentiation towards cells of the mature macrophage type, by greatly enhanced survival, and by slight but definite proliferation, as compared to cells grown in the absence of antigen.

II. The peritoneal exudate cells of tuberculin-sensitive g.pigs, used in earlier surviving cell culture experiments, were shown to produce small but typical delayed reactions when mixed with antigen and injected into the skin of normal g.pig recipients.—R.M.

OLIVEIRA-LIMA, A. (1958). **Passive transfer of the delayed dermal sensitivity to tuberculin by means of blood leukocytes. The impeding effect of specific desensitization.**—*Amer. Rev. Tuberc.* **78**, 346-352. [Summaries in French and Spanish. Author's summary modified.] **310**

The leucocytes of human patients hypersensitive to tuberculin lost the capacity to transfer passively the delayed dermal sensitivity to tuberculin soon after the patients were specifically desensitized. The desensitized state obtained after repeated i/m injections of large doses of Old Tuberculin, together with defatted tubercle bacilli, was specific, since it was not accompanied by desensitization to a streptococcal antigen. Tuberculin-inhibiting antibody was not detected in the sera of the desensitized patients. It is suggested that the desensitization obtained with injections of large doses of tuberculin might be due to specific exhaustion of sessile antibodies by tuberculo-proteins.

SCHIFFNER, E. (1958). Die Ursachen gehäufter Aberkennungen tbc-freier Rinderbestände in einem Weidegebiet und Vorschläge zur Vermeidung von Reinfektionen. [**Causes of re-infection in tuberculosis-free herds and suggestions for the prevention thereof.**]—*Mh. VetMed.* **13**, 392-397. **311**

Tuberculin tests revealed re-infection in 44 of 95 attested herds. The causes of reinfection were, in order of importance: grazing attested cattle in fields bordering infected farms; inefficient pasteurization of the milk supplied to calves; poultry with avian tuberculosis; and, in one case, purchase from an unattested herd. The following preventive measures were then carried out: grazing attested cattle in fields away from infected farms and, where this was impracticable, confinement by two wire fences separated by at least 3 metres; separate collec-



tion and pasteurization of milk from attested and infected herds, using different churns; the supply of all calves with milk from attested cattle only; and slaughter or housing of infected poultry flocks.—M.G.G.

SEELEMAN, M. & BUSCHKIEL, H. (1958). Chemoprophylaktische Versuche bei Rindertuberkulose. III. Mitteilung (Schluss). [Chemoprophylactic experiments in bovine tuberculosis. III.]—*Zbl. VetMed.* 5, 609-628. [Summaries in English, French and Spanish. English summary modified.] 312

In continuation of earlier chemoprophylactic studies [*V.B.* 27, 2587] it was found that complete healing of primary infection in young cattle is not possible even when 10-20 mg. "Ferroteben"/kg. is given daily for several months. The tuberculin reaction during administration of the drug became less marked and sometimes was even negative, but serological tests (haemagglutination-haemolysis) remained doubtful. At slaughter macroscopic foci were sometimes present, in which occasionally living tubercle bacilli were demonstrable by animal inoculation.

In contrast, experiments under practical conditions confirmed the findings reported earlier, that regular administration of the above preparation, alone or with "Conteben" [thiacetazone, B.P.C.] had prophylactic value.

GUINDI, S. M. (1957). Incidence of avian tuberculosis in domesticated birds in Egypt and methods of eradication and treatment.—*Vet. med. J., Giza* 4, No. 4 pp. 55-61. 313

The incidence of TB. in birds in Egypt was low. A small-scale trial indicated that treatment of tuberculous fowls with isoniazid or dihydrostreptomycin plus para-amino salicylic acid, was beneficial although no drug eliminated infection. —R.M.

RANKIN, J. D. (1958). The present knowledge of Johne's disease.—*Vet. Rec.* 70, 693-697. [Author's summary modified.] 314

Johne's disease has assumed a position of importance in the livestock economy of Gt. Britain. The salient features of our factual knowledge of the disease, and the trends of thought on its possible control are presented and discussed.

SCHWARZ, I. (1957). Untersuchungen über die Komplementbindungsreaktion bei Paratuberkulose mit Antigenen aus verschiedenen Paratuberkelbakterienstämmen. [Comple-

ment-fixation test in Johne's disease with antigens prepared from various strains of the bacillus.]—*Inaug. Diss., Munich* pp. 82. 315

Antigens were prepared from 10 different strains of *M. johnei* by four different methods. For complement-fixation tests the technique described by Schaaf & Zantinga [*Tijdschr. Diergeneesk.* 80, 1002 (1955)] was used in preference to that described by Hole [*V.B.* 24, 1777 & 2213]. The technique of Schaaf & Zantinga is similar to that used for the c.f. test in brucellosis. Antigen prepared by treatment of bacilli in a homogenizer for 15 min. gave better results than bacilli homogenized for 5 min., and bacilli extracted with phenol. Four strains of bacillus (C Hull, C300, no. 3384 and no. 3390 from the Animal Hygiene Institute at Munich) gave better results than the other six strains. The c.f. test was regarded as a practical diagnostic method in tuberculosis-free herds.—R.M.

MUNDT, W. (1958). Über die Bedeutung der Gaumenmandeln (Tonsilla palatina) beim Schwein im Hinblick auf das Zustandekommen einer Rotlaufinfektion. [Role of the tonsils in swine erysipelas.] — *Tierärztl. Umsch.* 13, 47-48. 316

*Erysipelothrix rhusiopathiae* often occurs in the tonsils of normal slaughter pigs. It is suggested that, in healthy pigs, the organism enters the tonsils but is destroyed in the lymph nodules there. In pigs weakened by transport fatigue, the tonsils are less efficient and the organism can penetrate the vascular system of the tonsils and spread throughout the body. Examination of the tonsils of pigs that had died from erysipelas revealed necrosis of the lymph nodules.

—M.G.G.

SHATALOV, V. F., MUROMETS, G. K. & TSIMOKH, P. F. (1958). [Vaccination of pigs after injection of swine erysipelas immune serum.]—*Veterinariya, Moscow* 35, No. 7. pp. 30-31. [In Russian.] 317

Nine pigs, 5 months old, were inoculated s/c with immune serum against swine erysipelas. After 12 days vaccine was administered, in 4 s/c and in 5 i/d; 12 days later a second dose of vaccine was given. The pigs were challenged with virulent culture 25 days after the second vaccination. Six developed erysipelas, but recovered without treatment. On the other hand, of 5 pigs vaccinated twice s/c without previous inoculation of serum, 2 had fever for 2 days, but no other signs of disease were seen. It is concluded that the serum interfered with the development of immunity.—M.G.G.



BLUM, H. (1958). Mastitis bei Rindern durch *Pasteurella multocida*. [Mastitis in cattle caused by *Past. multocida*.] — *Mh. VetMed.* 13, 225-226. 318

Two cases of mastitis in cows in different herds are described. The causal agent was *Past. septica*. In one case a pure culture of the organism was obtained from the udder secretion, in the other a mixed culture of *Past. septica* and *Corynebacterium pyogenes*.—M.G.G.

GORET, P., JOUBERT, L. & PILET, C. (1957). Recherches expérimentales sur la pseudotuberculose. I. Infection du cobaye. Rôle de l'allergie. II. Pseudo-tuberculose du chat. Diagnostic allergique expérimental. III. Infection expérimentale du chat. Rôle de l'allergie. [Experimental study of pseudotuberculosis. I. Infection of guinea-pigs. II. Allergic skin test for diagnosis of infection in cats. III. Experimental infection of cats.]—*C. R. Soc. Biol., Paris* 151, 1866-1868, 2062-2064 & 2116-2119. 319

I—III. Six g.pigs were infected by oral administration of cultures of *Past. pseudotuberculosis*: Repeated doses 3, 6, 9 or 12 days after the initial dose caused either rapid death or chronic infection. This was regarded as evidence of specific allergy.

Allergen was prepared by peptic hydrolysis of cultures of *Past. pseudotuberculosis*. When 0.5–2 ml. was inj. [? subcutaneously] there was a rise in body temp. by 1–2°C. 7–9 hours later in 5 of 6 experimentally infected cats. 2 uninfected cats did not react.

Four cats were given repeated doses of cultures. All reacted to allergen 2 months later. One died 2 months after infection, another at 6 months and the other two were killed 2 and 16 months after infection. The organism was recovered only from 2 cats which died, and these animals had miliary lesions in the spleen. The cat killed at 2 months had an enlarged spleen and the cat killed at 16 months had no lesions. —R.M.

GOULD, C. M. (1958). Infectious white scour in calves.—*Vet. Rec.* 70, 697-700. [Author's summary modified.] 320

An outbreak of infectious white scour in calves is described, caused by *Escherichia coli* resistant to the tetracyclines and partially so to streptomycin. Its course was followed by direct cultures from rectal swabs. Its spread, treatment, and control are described. Prevention of outbreaks in calf buying and rearing establishments is discussed.

SMITH, H. WILLIAMS. (1958). Further observations on the effect of chemotherapy on the presence of drug-resistant *Bacterium coli* in the intestinal tract of calves.—*Vet. Rec.* 70, 575-580. [Author's summary modified.] 321

Studies on white scours revealed many more drug-resistant *Escherichia coli* in the faeces of calves in herds in which the calves were given drugs therapeutically or prophylactically than in calves in herds in which chemotherapy was never employed. More resistant *E. coli* were also found in the calf population as represented by calves for sale at a market than were found in the latter group. The value of basing the drug treatment of white scours on sensitivity tests was confirmed. However, successful chemotherapeutic control of white scours in herds in which this disease frequently occurred was difficult to attain. *E. coli* with multiple resistance to streptomycin, the tetracyclines, chloramphenicol and sulphadimidine eventually formed the predominant faecal flora in cases of white scours in some of these herds. A combination of phage-typing and testing for sensitivity to drugs indicated that the emergence of resistant *E. coli* during chemotherapy was probably due in some instances to mutation of sensitive *E. coli*. *In vitro*, sensitive cultures of *E. coli* were made resistant to streptomycin, chloramphenicol and sulphadimidine, both singly and multiply. Strains could not be made resistant to either the tetracyclines or furazone. Of 56 herds in which white scours occurred, only 8 were completely self-contained. *Salmonella* organisms were present in the faeces of only 3 of 184 cases of scours in 60 herds. *Shigella* was not found.

GROOTENHUIS, G. (1958). Abortus Bang. Een enquête op het eiland Walcheren welke o.m. de verspreiding van *Brucella abortus* Bang en de voortplantingsstoornissen betreft. [Occurrence of *Br. abortus* on Walcheren island, in relation to sterility.]—*Tijdschr. Diergeneesk.* 83, 14-23. [English, French and German summaries.] 322

Breeding records of 1,332 cows in 172 herds were studied. Infertility and abortion were only slightly more frequent in brucella-infected farms than in brucella-free herds. There was no evidence that infertility and abortion were less common in animals vaccinated with Strain 19 than in unvaccinated animals. More than half the abortions recorded appeared to be due to non-infectious causes.—R.M.

SCHRINNER, E. [Edited by.] (1958). Fragen zur Rinderbrucellosebekämpfung. Symposium der Deutschen Gesellschaft für Züchtungs-



kunde am 22. Oktober 1957 in Stuttgart-Bad Cannstadt. [Control of bovine brucellosis. A symposium of the German Society of Animal Breeding, held on Oct. 22nd 1957 at Stuttgart.] — *Zuchthyg. FortpflStörung. u. Besamung*, 2, 16-34. 323

The regulations governing the diagnosis and control of bovine brucellosis in different parts of Western Germany are presented in tabular form. The possibility of assimilating the varying regulations was discussed and some regulations which could be applied to the country as a whole were proposed.—M.G.G.

GUDOSHNIK, A. N. (1958). [Role of pasture ticks and rodents in the dissemination of brucella.]—*J. Microbiol., Moscow* 29, No. 8 pp. 113-117. [In Russian.] 324

Brucella organisms (species not stated) were isolated from *Dermacentor marginatus* and *D. pictus* from farm animals or from pastures on infected farms; ticks from non-infected farms gave negative results. Ticks infected with brucella during the nymphal stages did not transmit infection to a sheep, but the organism could occasionally survive metamorphosis of the tick and transovarial transmission was possible. Of 372 rodents caught on an infected farm, 3 house mice harboured brucella.—R.M.

IVANOV, M. M. & OTHERS. (1957). [Trials with four vaccines against brucellosis.]—*Trud. nauchno-kontrol. Inst. vet. Preparatov* 7, 41-46. [In Russian.] 325

50 Caucasian sheep were divided into 5 groups. Each group was inoculated with one of the following vaccines: formalized aluminium hydroxide vaccine from Strain 68 [V.B. 27, 376]; glycerol vaccine from Strain 3 [V.B. 26, 746]; live vaccine from *Br. suis* Strain 61 [V.B. 27, 3203]; live dried Strain 19 in a dose of 5,000 million organisms; Strain 19 in a dose of 25,000 million organisms. Serological reactions were tested five weeks and five months after inoculation. 45 days after inoculation 2 sheep from each group were killed and pathological and bacteriological examinations were negative in every case. 5 months after inoculation the remaining sheep and 10 unvaccinated controls were challenged with 500,000 organisms of *Br. melitensis*. All sheep inoculated with the higher dose of Strain 19, and all except one inoculated with the smaller dose of this strain, resisted challenge, so did all sheep inoculated with Strain 61. Results with the two killed vaccines were poor.—R.M.

DOH, F. (1958). Zur Frage der Immunisierung von Mäusen gegen Brucella-Abortus mit

Adsorbat-Impfstoffen. [Immunization of mice against *Br. abortus* with killed adsorbed vaccines.]—*Inaug. Diss., Munich* pp. 29. 326

Two batches of 50 mice were inoculated twice with one of two proprietary brucella adsorbate vaccines. The second inoculation was given 10 days after the first. A third batch was inoculated with Strain 19 and a fourth batch was left uninoculated. All were challenged 14 days after the last inoculation by i/p inj. of virulent *Br. abortus*. 42 mice inoculated with one of the adsorbate vaccines and 48 inoculated with the other survived, so did 47 of those inoculated with Strain 19. 3 of 50 unvaccinated controls survived.—R.M.

MYAKISHEVA, A. M. & LOBOVA, A. A. (1957). [Preparation of brucella agglutinating sera from cattle.]—*Trud. nauchno-kontrol. Inst. vet. Preparatov* 7, 71-74. [In Russian.] 327

Oxen were hyperimmunized by s/c inj. of increasing doses of a killed brucella antigen, prepared from all 3 species of brucella, followed by increasing doses of Strain 19, administered s/c and i/v. Injections were given at intervals of 4-5 days. Collection of blood commenced about 12 days after the last injection and not more than two bleedings could be made monthly for 8-10 months.—R.M.

PAL'GOV, A. A. (1957). [Dried brucella antigen for the agglutination test.]—*Trud. nauchno-kontrol. Inst. vet. Preparatov* 7, 76-79. [In Russian.] 328

P. described preliminary studies on the freeze-drying of heat-killed suspensions of brucella. Preparations remained active after 3 years. No additive or preservative was required. Phenolized suspensions were unsuitable for freeze-drying.—R.M.

SULITZEANU, D. (1958). Relationship of agar diffusion patterns to agglutinating and protective properties of *Brucella suis* antisera.—*Brit. J. exp. Path.* 39, 367-375. [Author's summary modified.] 329

By a variety of absorption and immunization procedures immune sera against *Br. suis* were obtained with widely different patterns of agar diffusion. None of the 7 lines could be correlated with the presence or absence of agglutinins. Good correlation was found between agglutinating and passive protection power of sera in mice. The two activities seemed to be due to the same antibodies. Two agglutinogens were demonstrated in the insoluble cell debris of *Br. suis*. One of them was also found in soluble form after ultrasonic disintegration of



bacteria. The possible role of antigenic competition between the immunizing and inert antigens was discussed.

IVANOV, M. M. & ROMANOV, A. M. (1957). [Importance of the type-specificity of brucella for the allergic diagnosis of brucella.]—*Trud. nauchno-kontrol. Inst. vet. Preparatov* 7, 54-56. [In Russian.] 330

A small-scale experiment indicated that brucella lysate allergen from *Br. melitensis* would detect more brucella-infected sheep than the standard allergen from *Br. suis* Strain 22. The activity appeared to depend not only on the type of brucella used, but also on the allergenic properties of the strain.—R.M.

REUSSE, U. & SCHINDLER, R. (1957). Vergleichende Prüfung verschiedener Methoden der Brucellenblutkultur. [Evaluation of blood culture methods for brucella.]—*Z. Hyg. InfektKr.* 143, 578-586. 331

The authors compared the method described by Castañeda [*V.B.* 19, 845], the membrane filter method described by Braun & Kelsh [*V.B.* 24, 2647], and egg inoculation, as described by Gay & Damon [*V.B.* 22, 948]. The three methods gave similar results. Advantages and disadvantages of each method were discussed.—R.M.

RENOUX, G. (1958). Comparaison de quelques milieux solides pour la culture des Brucella. [Solid media for growth of *Brucella* spp.]—*Arch. Inst. Pasteur Tunis* 35, 199-210. 332

R. tested four solid media to find one cheap and easy to prepare for the culture of brucella species. 42 strains from the Institut Pasteur, Tunis were first inoculated into g.pigs and material from the g.pigs was then sown on to each medium; and for direct inoculation and subculture 12 known strains of *Br. melitensis*, *abortus*, *suis* and *intermedia* were used, with the following media: "Albimi" agar, tryptose-agar, liver agar and potato-agar (B.A.I.). 10% filtered sterile horse serum free from brucella antibodies was added to each medium, and for *Br. abortus* incubation was in 10% CO<sub>2</sub>. He found that to isolate a strain three or four g.pigs may be necessary. In each series of tests potato-agar plus serum was the best and was easy to prepare, is relatively cheap and keeps well as a stock medium.—W. K. DUNSCOMBE.

PIKE, R. M. & SCHULZE, M. L. (1958). Serologic variants of leptospira types resulting from growth in immune serum.—*J. Immunol.* 81, 172-175. [Authors' summary modified.] 333

*Leptospira grippo-typhosa*, *pomona* and *canicola* underwent prolonged cultivation in the presence of homologous immune sera. A marked reduction in agglutinability by the sera in which the strains were grown resulted. Comparison of the altered strain of *L. grippo-typhosa* with the original culture by reciprocal absorption indicated that both loss and gain of antigenic components had apparently occurred. The change in serological reactivity observed in these 3 types has remained stable for more than 8 months.

LINDQVIST, K. J., MORSE, E. V. & LUNDBERG, A. M. (1958). Experimental *Leptospira pomona* infection in pregnant ewes.—*Cornell Vet.* 48, 277-290. [Authors' summary modified.] 334

In leptospirosis in pregnant ewes symptoms were usually mild and lambing occurred normally. Leptospirae were not demonstrable in foetal organs, blood, or amniotic fluids. Leptospiral antibody was not present in foetal blood or the blood of lambs before suckling. Blood haemoglobin and erythrocyte values were slightly decreased, and a mild leucopenia was present, during or shortly after the acute or leptospiraemic phase of the disease.

Leptospirae were shed in the milk of an infected ewe during the acute phase of the disease, but lambs sucking the ewe did not contract leptospirosis. Ewes which were excreting leptospirae in their urine did not transmit the disease to their lambs or to an uninfected ewe and its lambs. The role of sheep in the transmission of *L. pomona* infection in the U.S.A. appears to be minor. On the other hand, sheep prove to be suitable experimental animals for this infection.

KISER, J. S., CLEMENTE, J. & POPKEN, F. (1958). A comparison of the effectiveness of several antibiotics against an experimental infection with *Leptospira icterohaemorrhagiae* or *Leptospira pomona* in chick embryos. In "Antibiotics Annual" 1957-58. pp. 259-267. [New York: Medical Encyclopedia Inc.] [Authors' summary modified.] 335

The authors tested tetracycline, chlortetracycline, erythromycin, spiramycin and benzylpenicillin against both species of leptospira in chick embryos. All were highly effective against both infections. The strain of *L. pomona* used was more sensitive to all antibiotics except penicillin than the strain of *L. icterohaemorrhagiae*.

STOENNER, H. G., GRIMES, E. F., THRAILKILL, F. B. & DAVIS, E. (1958). Elimination of *Leptospira ballum* from a colony of Swiss



**albino mice by use of chlortetracycline hydrochloride.**—*Amer. J. trop. Med. Hyg.* **7**, 423-426. **336**

The leptospire was apparently eradicated from a large lab. colony of mice by feeding pelleted feed containing 1 kg. chlortetracycline hydrochloride per ton for 10 days. After 7 days' treatment, mice were transferred to clean containers equipped with clean, sterile water in sterile bottles.—R.M.

ESKIN, V. A. & OTHERS. (1958). [**Epidemiology and clinical features of *Leptospira ussuri* infection.**]—*J. Microbiol., Moscow* **29**, No. 8 pp. 54-60. [In Russian.] **337**

*L. ussuri* (also known as leptospire type DV-II) was widely distributed among human beings and farm animals in the Far East of the U.S.S.R., in North Korea and in north-west China. Antibodies were found in sera from 92 of 153 cattle and calves; in 41 they were those of *L. ussuri*. Sera from 11 of 28 horses were positive for leptospira, and in 8 cases *L. ussuri* was involved. 3 of 55 geese were positive (2 to *L. ussuri*). Cattle were the principal reservoir of human infection; rodents were apparently not involved. In man infection occurred during summer and autumn from infected drinking water. The disease was characterized by fluctuating fever, skin eruption, absence of jaundice, recurrences, and complications in organs of sense. The disease in cattle was chronic, and it was necessary to differentiate it from TB. and brucellosis. —R.M.

ANNEAR, D. I. (1958). **Observations on the preservation by drying of leptospirae and some other bacteria.**—*Aust. J. exp. Biol. med. Sci.* **36**, 1-4. [Author's summary modified.] **338**

Three strains of leptospira were recovered from dried peptone plugs after storage for two years. The shortest lag period before visible growth was ten days. The relationship between inoculum size and length of lag period varied irregularly.

In the preservation of a number of other bacteria by drying *in vacuo* over  $P_2O_5$ , better results were obtained when the suspensions were placed on tufts of cotton wool than on the glass bottom of ampoules.

THOMPSON, J. K. & BASSON, C. H. (1958). **A case of *Clostridium welchii* (Type A) infection in a dog.**—*J. S. Afr. vet. med. Ass.* **29**, 75. **339**

Gas gangrene developed rapidly following a subcutaneous injection. A few hours after

injection the body temp. was 106°F. and there were signs of acute toxæmia. Treatment with oxytetracycline failed and the dog died 14 hours after commencement of treatment. *Cl. welchii* Type A was isolated from the lesion.—R.M.

ORLANS, E. S. & JONES, V. E. (1958). **Studies on some soluble antigens of *Clostridium welchii* Types B, C and D.**—*Immunology* **1**, 268-290. [Authors' summary modified.] **340**

The soluble antigens produced by 20 strains of *Cl. welchii* Types B, C and D were investigated. The methods used were the Ouchterlony double diffusion method in agar gel, and the classical tests for lethal, haemolytic and enzymic factors.

Concentration of the culture filtrates, necessary to demonstrate the antigens by gel diffusion, was effected by freeze-drying. Precipitin bands due to alpha, beta and epsilon toxins and their corresponding antibodies, were identified.

All the toxins investigated appeared during the active growth phase; some, e.g. beta and delta toxins, declined rapidly with longer incubation. This decline, together with the conversion of the epsilon-precursor to active toxin, could be attributed to the action of enzymes which were also present in the filtrates, and the same effect could be produced by treatment with trypsin.

The antigens of the Type D strains conformed to the expected pattern. Those of the Type B and C strains, however, exhibited wide variation in distribution and quantity, and were occasionally found in combinations that fitted neither of the accepted types.

VOIGT, A. & HAASE, H. (1958). **Zur Frage des Versicherungsfalles bei *Vibrio*-fetus-infizierten Deckbullen.** [***Vibrio fetus* infection in bulls and livestock insurance.**]—*Mh. VetMed.* **13**, 148-150. **341**

Stud bulls infected with *V. fetus* should be culled. Valuable bulls, however, may be treated and, after 3 months, allowed to serve first of all cows which have recovered from the infection, and, at least 6 months later, susceptible cows and heifers. Insurance companies should be able to find the cost for such a scheme, as only the less valuable bulls would be culled.—M.G.G.

VANDEPLASSCHE, M. (1958). **Die Pathogenese der Vibriosis bei weiblichen Rindern.** [**Pathogenesis of vibriosis in female cattle.**]—*Zuchthyg. FortpflStörung. u. Besamung* **2**, 10-15. **342**

Heifers were served by bulls infected with *Vibrio fetus* and later slaughtered for bacteriolo-



gical and histological examination. It was found that *V. fetus* invades the uterus rapidly. The fallopian tubes of one heifer were infected on the 22nd day after service and those of another on the 24th day. *V. fetus* was isolated regularly from the uterus of heifers slaughtered 5-35 days after service, but not always from those slaughtered 50 days to 8 months after service, although cultures of vaginal mucus remained positive. Histological examination of uterine tissue revealed a rapid but mild inflammatory process that reached its peak 5-6 weeks after infection. —M.G.G.

HARDENBROOK, H., JR. (1958). **The diagnosis and treatment of nonspecific infections of the bovine uterus and cervix.**—*J. Amer. vet. med. Ass.* **132**, 459-464. **343**

Non-specific infections may include staphylococci and streptococci, corynebacteria, proteus, and *Escherichia coli*. Uterine biopsy with a Nielsen-type instrument is recommended and its use described for bacteriological investigations. 80% of breeding failures in Illinois are considered to be due to these conditions. In two-thirds of the cases streptococci, staphylococci and corynebacteria are considered "responsible for" the changes. In the author's experience corynebacteria are rather resistant to antibiotics. Sulphonamides and Lugol's iodine may also be used. Adjuvant parenteral treatment with hormones is recommended.—F. L. M. DAWSON.

BOYLES, W. A. & LINCOLN, R. E. (1958). **Separation and concentration of bacterial spores and vegetative cells by foam flotation.**—*Appl. Microbiol.* **6**, 327-334. **344**

Foam was produced in vertical glass cylinders containing bacterial cultures by passing sterile compressed air through glass spargers (diffusers) at the bottom of the cylinder. The foam passed out of a side-arm at the top of the cylinder into a collecting flask. Using this method it was possible to collect spores of *B. anthracis* and cells of rough or mucoid (but not smooth) variants of *Br. suis*.—R.M.

✓ ZONTINE, W. J. (1958). **Coccidioidomycosis in the horse—a case report.**—*J. Amer. vet. med. Ass.* **132**, 490-492. **345**

This is believed to be the first description of the disease in horses. A five-year-old mare died after a four months' illness characterized by progressive emaciation, fluctuating temperature, moderate anaemia, marked leucocytosis, oedema of the lower parts of the legs and a peculiar pointing of the fore feet. The cause of death was haemorrhage from liver rupture.

Abscesses of various sizes were scattered through the lungs, spleen and liver. Diagnosis was made by the Armed Forces Institute of Pathology from lesions submitted by the author.

—E. G. WHITE.

✓ BARBESIER, J. (1958). **Présence d'un champignon levuriforme dans le lait d'une vache atteinte de mammite. [*Candida krusei* causing mastitis in a cow.]**—*Arch. Inst. Pasteur Algér.* **36**, 12-14. **346**

A fungus having the morphological, cultural and biochemical properties of *C. krusei* was isolated from the secretion of two quarters affected with acute mastitis which failed to respond to antibiotic therapy. Four mice were each inoculated i/p with 0.5 ml. of a suspension of a 24-hour culture. Two remained normal and no lesions were found. Two died and the fungus was recovered from peritoneal exudate and spleen.—R.M.

✓ DI MENNA, M. E. (1958). ***Candida albicans* from grass leaves.**—*Nature, Lond.* **181**, 1287-1288. **347**

*Candida albicans* was isolated from a sample of New Zealand pasture lightly stocked with sheep. The fungus is considered unlikely to be a true member of the phyllosphere flora but to originate from the alimentary tract of animals, e.g. sheep, dogs, hedgehogs and Australian opossums, all of which are known to carry the organism.—E. G. WHITE.

✓ WINNER, H. I. (1958). **An experimental approach to the study of infections by yeast-like organisms.**—*Proc. R. Soc. Med.* **51**, 496-499. **348**

Guinea-pigs treated with cortisone showed no larger or more lasting lesions when injected intradermally with *Candida albicans* than did untreated animals. The same happened with intraperitoneal infection with the fungus. Rabbits die within a few days after intravenous injection of large doses of *C. albicans*: the organism is widely distributed, especially in the kidney, but there is a striking lack of cellular reaction and no swelling of spleen or lymph nodes. Killed organisms have no effect. Large doses of living cultures of related members of the *Candida* group are non-pathogenic by the intravenous route and do not multiply. Some culture filtrates from *C. albicans* grown in peptone water at 37°C. for a few days produce erythema in g.pigs and rabbits which does not develop in cortisone-treated animals. The heat-stable toxic factor has not yet been isolated. W.



suggests that it may be in part, but not entirely, responsible for the toxicity of *C. albicans*.

—E. G. WHITE.

OSSWALD, H. & SEELIGER, H. P. R. (1958). Tierexperimentelle Untersuchung mit antimycotischen Mitteln. 1. Mitteilung. [Animal experiments with anti-fungal substances. I. Action of mycostatin and amphotericin B on *C. albicans* and *Mucor pusillus* infections in mice.—*Arzneimittelforsch.* 7, 370-374. 349

Both drugs were efficacious in both infections; amphotericin B appeared to be more active and less toxic than mycostatin ("Nystatin").

—R.M.

KREGER-VAN RIJ, N. J. W. (1958). The relationship between *Saccharomyces telluris* and *Candida bovina*. — *Antonie v. Leeuwenhoek J. Microbiol.* 24, 137-144. 350

It was concluded that *Sacch. telluris*, first isolated from dental caries and from soil in South Africa, was the perfect stage of *C. bovina*, first isolated from the caecum of a cow [V.B. 27, 2347]. Other strains isolated from the caecum of a horse, the crop of a turkey and the lung of a pullet were compared with the type strains and with *Torulopsis pintolopesii*.—R.M.

SUTMÖLLER, P. & POELMA, F. G. (1957). *Cryptococcus neoformans* infection (torulosis) of goats in the Leeward Islands region. — *W. Ind. med. J.* 6, 225-228. [Summary in Interlingua. English summary modified.] 351

During the period 1953-56 Government meat inspectors in the Netherlands Antilles observed *C. neoformans* infection in 51 of 6,578 goats slaughtered, as compared with 20 of 19,854 slaughtered in Curaçao. The diseased animals came from the Leeward Islands of the Netherlands Antilles (Aruba, Bonaire and Curaçao), Colombia, and Venezuela. Lesions were mainly restricted to foci in the lungs.

LIBEAU, J. R. (1958). La lymphangite épizootique (état actuel de la question). [Epizootic lymphangitis of equines (the present position).]—*Bull. epiz. Dis. Afr.* 6, 203-209. [In French. Summary in English pp. 173-175.] 352

This is a brief review by a member of the staff of the Inter-African Bureau for Epizootic Diseases. Geographical distribution, aetiology, diagnosis, treatment and prevention are dealt with, including recent Russian findings relating to the possibility of transmission by biting insects and the use in diagnosis of the complement-fixation test with a heated culture extract as antigen.—E. G. WHITE.

KALISZ, G. A. (1958). Hexetidine. A new anti-fungal agent.—*Mod. vet. Pract.* 39, 48-49. 353

Hexetidine (bis-1, 3 - betaethylhexyl - 5 - methyl-5 amino hexahydropyrimidine) solution was used successfully in the treatment of ringworm in two groups of yearling calves. It is stated that a single dressing cured the fungal lesions and the secondary bacterial infections.

—E. G. WHITE.

GENTLES, J. C. (1958). Experimental ringworm in guinea pigs: oral treatment with griseofulvin.—*Nature, Lond.* 182, 476-477. 354

Griseofulvin, a metabolic product of several *Penicillium* species, is active *in vitro* against all the common dermatophytes. It was effective when given by mouth at a dosage of 60 mg./kg. in controlling experimental infections in the g.pig with *Microsporum canis* and *Trichophyton mentagrophytes*. Further work is in progress.

—E. G. WHITE.

HUBBEN, K. (1958). Case report—*Aspergillus meningoencephalitis* in turkeys and ducks.—*Avian Diseases* 2, 110-116. 355

Two outbreaks of aspergillosis in turkey poults and one in eider ducklings were associated with nervous symptoms and with inflammatory lesions in the brain and meninges in which the fungus was demonstrated by culture and in histological sections. The more usual lesions in the air-sacs, lungs and liver were also present.

—E. G. WHITE.

MEMERY, G., MORNET, P. & CAMARA, A. (1958). Premiers cas authentiques de farcin du boeuf en Afrique occidentale française. Note préliminaire. [First report of "bovine farcy" (*Nocardia farcinica* infection) in French West Africa.]—*Rev. Elev.* 11, 11-16. [Summaries in English and Spanish.] 356

During 1957 cases of nocardiosis due to *Nocardia farcinica* were identified in cattle in Senegal, the first record in French West Africa. Although the disease can be identified in life by its characteristic external lesions, it is easy to confuse it post-mortem with tuberculosis. A brief description is given of the symptoms, lesions and causal organism.—E. G. WHITE.

ROLLE, M., ILUKEVICH, A. & MUNDT, W. (1957). Sobre la causa etiologica del moquillo infecciosa de las gallinas. (Coriza infecciosa gallinarum). [Aetiology of infectious avian coryza.]—*Rev. vet. venez.* 2, 96-103. 357

This is a revised version of work published in German in 1951 [V.B. 22, 2764]. A fungus



isolated from infectious coryza of fowls in Venezuela and Bavaria was identified as belonging to the genus *Scopulariopsis*.—R.M.

- CHUTE, H. L. & O'MEARA, D. C. (1957). A bibliography of avian mycosis.—*Misc. Publ. Me agric. Exp. Sta.* No. 631. pp. 81. 358

Some 500 references are listed alphabetically under the names of the authors. Some of the items are annotated by what, in many cases, appear to be verbatim reproductions of abstracts from the *Veterinary Bulletin*.

References to infection by *Sarcosporidia* are also given.

There are host, parasite, anatomical and treatment indexes.

- TERSKIKH, V. I. (1958). [Sapronoses—diseases of man and animals caused by micro-organisms capable of living in the external environ-

See also absts. 363 (diagnosis of *V. fetus* in preputial washings); 579 (abortion in cows); 597 (report, Northern Rhodesia); 598 (report, Tanganyika); 599 (report, Denmark); 600 (report, Netherlands).

#### DISEASES CAUSED BY PROTOZOAN PARASITES

- CULBERTSON, C. G., SMITH, J. W. & MINNER, J. R. (1958). *Acanthamoeba*: observations on animal pathogenicity. — *Science* 127, 1506. 361

Amoebae found in cultures of trypsinized monkey kidney cells were tentatively classified as *Acanthamoeba* [see also *V.B.* 28, 1740]. Following intracerebral inoculation of the organisms, destructive encephalitis occurred in monkeys and mice. Intravenous inj. resulted in the formation of perivascular granulomatous lesions around amoebae that had evidently escaped from pulmonary vessels. Large numbers of amoebae in the lungs caused pneumonia. Sections of kidney revealed amoebae in glomerular capillaries.—R.M.

- GRIFFITHS, B. L. (1958). The colloidal gum mastic reaction in experimental trypanosomiasis.—*J. med. Lab. Tech.* 15, 275-279. 362

The colloidal mastic reaction of Cutting detects changes in the ratio of albumin to globulin in cerebrospinal fluid. G. applied the test to blood plasma from rabbits, rats, sheep, oxen and other mammals infected with trypanosomiasis, and found that plasma from infected animals gave positive reactions and plasma from uninfected animals gave negative results. The reaction was therefore of potential value for the diagnosis of trypanosomiasis.—R.M.

- MUNDT, W. (1958). Ein Spülmedium zur Diagnostik für *Vibrio foetus* und *Trichomonas*

ment.]—*J. Microbiol., Moscow* 29, No. 8 pp. 118-122. [In Russian.] 359

The term sapronoses was coined to cover diseases caused by organisms which are principally saprophytes, including botulism, stachybotrymycosis, and fusariotoxycosis.—R.M.

- KELLER, H. (1958). Über die Isolierung von pleuropneumonie-ähnlichen Erregern bei Hühnern. [Isolation of pleuropneumonia-like organisms from fowls.] — *Schweiz. Arch. Tierheilk.* 100, 45-51. [Summaries in English, French and Italian.] 360

Five strains of pleuropneumonia-like organisms were isolated from fowl carcasses from various parts of Switzerland. They did not appear to be pathogenic for chick embryos and chicks. Of 1581 fowl sera 82% gave positive agglutination reactions for the infection.

—M.G.G.

foetus. [Diagnosis of *Vibrio fetus* and *Trichomonas foetus* infection in bulls by culture from preputial washings, using a special medium.]—*Prakt. Tierarzt.* No. 5. pp. 140-148. 363

A medium for the diagnosis of *V. fetus* and *Tr. foetus* infection in bulls was developed, consisting of peptone, sodium phosphate, glutathion, glucose, yeast, streptomycin sulphate, and a modified Ringer's soln., adjusted to pH 7.4 with 10% sodium hydroxide soln. Both organisms survived storage in the medium for up to 112 hours at 4°C., or up to 4 days at room temp., before being incubated at 37°C.

—M.G.G.

- CLARKSON, M. J. (1958). The life history of *Eimeria meleagridis* Tyzzer, 1929, in the turkey poult. — *Trans. R. Soc. trop. Med. Hyg.* 52, 301. [Author's abst. modified.] 364

The life history was demonstrated by a series of sections of the intestine of poult killed at intervals up to 6 days after infection with a pure strain obtained from a single oocyst. There are three asexual generations before the one sexual. The 1st-stage schizont is found only in the glands and contains some 80 merozoites, the 2nd and 3rd schizonts are small and contain some 12 merozoites, and the sexual stages are indistinguishable from those of other *Eimeria* species.

This work is to be described in detail elsewhere.



LONG, P. L. & ROWELL, J. G. (1958). **Counting oocysts of chicken coccidia.**—*Lab. Pract.* **7**, 515-518 & 534. [Authors' summary modified.] **365**

Haemocytometer counts of coccidial oocysts have been made to determine how accurately it is possible to infect a chicken with a specified number of oocysts. A table shows how the standard error depends on the number of oocysts in the fluid and the number of samples taken.

A method is described for counting oocysts in faeces. The basic technique is to add water and break up the faecal matter with a macerator, add a solution of sodium chloride and transfer to a test tube, dilute with a saturated solution of sodium chloride and transfer to a McMaster counting chamber. Details are given of some precautions which should be taken when using this technique. A formula is given which enables standard errors of estimates to be calculated.

KENDALL, S. B. & JOYNER, L. P. (1958). **Potential of the coccidiostatic effects of sulphadimidine by five different folic-acid antagonists.**—*Vet. Rec.* **70**, 632-634. [Authors' summary modified.] **366**

Several compounds of known activity against folic acid were compared for their ability to potentiate the coccidiostatic effects of sulphadimidine. When given in the food of chicks with 0.06% sulphadimidine, it was estimated that the following concentrations were needed to reduce mortality from *Eimeria tenella* to less than 10%:—Proguanil 0.1%; 2:4 diamino 6:7 diisopropyl pteridine 0.02%; 4:6 diamino 1-p chlorophenyl 1:2 dihydro-2:2 dimethyl 1:3.5 triazine 0.0008%; pyrimethamine 0.004%; and 4:6 diamino 1(3:4 dichlorophenyl) 1:2 dihydro-2:2 dimethyl 1:3.5 triazine 0.002%.

WRIGHT, A. I. & WOODFORD, M. H. (1958). **Bovine piroplasmosis.**—*Vet. Rec.* **70**, 627-632. [Authors' summary modified.] **367**

A brief review of bovine piroplasmosis in Gt. Britain. The life histories of *Babesia bovis* and *Ixodes ricinus* are outlined and the protective mechanisms of premunity and age-resistance are considered. The symptoms, diagnosis, treatment, and control are discussed, with observations on several important aspects of the disease which required investigation.

DAVIES, S. F. M., JOYNER, L. P. & KENDALL, S. B. (1958). **Validity of the species *Babesia divergens* (M'Fadyean and Stockman, 1911.)**—*Trans. R. Soc. trop. Med. Hyg.* **52**, 302. [Authors' summary modified.] **368**

At Weybridge, studies on the species of *Babesia* of cattle have indicated that the species found in Gt. Britain differs from that usually described as *Babesia bovis* in other parts of the world, including the area from which *B. bovis* was first described. A series of stained blood films made from cattle infected with *Babesia* illustrated the morphological differences between *B. bovis* Starcovici, 1893, and *B. divergens* (McFadyean & Stockman, 1911).

MAEGRAITH, B., GILLES, H. M. & DEVAKUL, K. (1957). **Pathological processes in *Babesia canis* infections.**—*Z. Tropenmed. u. Parasit.* **8**, 485-514. [In English. Summary in German.] **369**

The authors studied clinical signs, erythrocyte count, haemoglobin concentration, blood pigments, blood chemistry and histological changes in 60 young or adult dogs infected intraperitoneally or intravenously.—R.M.

FLANAGAN, H. O. & LE ROUX, J. M. W. (1957). **Bovine cerebral theileriosis—a report on two cases occurring in the Union.**—*Onderstepoort J. vet. Res.* **27**, 453-461. **370**

Bovine cerebral theileriosis ("turning sickness") caused by *Theileria mutans* infection is reported for the first time in S. Africa. Clinically the animals showed nervous symptoms. Haemorrhages and thrombosis of the blood vessels were noticed macroscopically in the brain. Microscopically the brain showed meningo-encephalitis, thrombosis of the blood vessels and demyelination. Koch bodies were demonstrable in the lymphocytes.

HAIBA, M. H. (1958). ***Gonderia herpestis* n. sp. from the Egyptian mongoose, *Herpestis ichneumon*.**—*Z. Parasitenk.* **18**, 428-434. [In English. Author's summary modified.] **371**

Egyptian mongooses of both sexes and various ages were investigated for piroplasm infection. Out of a total of 13 captured individuals from various parts of Egypt, 8 were infected with a new species of *Gonderia* for which the name "*Gonderia herpestis*" n. sp. was proposed. Only two of the infected animals were adults. The morphology and the fate of the various developmental and reproductive asexual stages of the parasite within both the peripheral blood and internal organs and phases of the life cycle were studied and compared with the findings of previous investigators in related species from different hosts in other countries.

FOOTE, L. E., GEER, J. C. & STICH, Y. E. (1958). **Electron microscopy of the anaplasma**



body: ultrathin sections of bovine erythrocytes.—*Science* 128, 147-148. 372

Blood containing *Anaplasma marginale* was prepared for examination under the electron microscope by fixing it in osmic acid, after which the blood cells were washed and then embedded in butyl methylacrylate. Sections of embedded cells were cut to a thickness of 0.025–0.05  $\mu$ .

The anaplasma body was seen as a clear space at the margin of the erythrocyte, containing from 1 to 7 masses of dense particulate matter each measuring 0.2–0.7  $\mu$  in diam. The particles usually consisted of a central mass and a peripheral ring separated by a clear zone in which are a variable number of dense strands connecting the central mass to the periphery.

It was stated that these observations supported Foote's previous conclusion [*V.B.* 24, 2686] that the causal agent of anaplasmosis was a virus.—R.M.

See also abst. 596 (report, Nigeria).

#### DISEASES CAUSED BY VIRUSES AND RICKETTSIA

PARAF, A., VERGE, J., DHENNIN, L. & ASSO, J. (1958). Propriétés antigéniques du virus aphteux "lapinisé". Production chez les bovins d'anticorps neutralisants et fixant le complément. [Antigenic properties of lapinized foot and mouth disease virus.]—*C. R. Acad. Sci., Paris* 247, 1145-1148. 375

Adaptation of Type C virus to rabbits has been described previously [*V.B.* 27, 3248; 28, 2826]. Rabbits and cattle inoculated with adapted virus developed neutralizing and complement-fixing antibodies in their serum.—R.M.

KABLOV, G. A. (1958). [Changes in nervous elements of skin and mucous membrane of the oral cavity in foot and mouth disease in cattle.]—*Ark. Pat.* 20, No. 9 pp. 43-48. [In Russian. Summary in English.] 376

Ten cattle were killed during the formation of primary aphthae, 15 during generalization of infection, and 3 a month after recovery. Sections of skin from lips and nose and oral mucous membrane were stained by Gros's modification of the Bielschowsky method, by Spielmeyer's method, and by haematoxylin-eosin. Within primary lesions, in the connective tissue papillae, most of the nerve fibres were argyrophile, homogenous, and swollen: many were undergoing degeneration. In large papillae, the usual branching of nerve bundles was much reduced. In apparently unaffected areas of lingual mucosa, nerve bundles showed irregular swelling, a loosening of structure

COONEY, M. K., KIMBALL, A. C. & BAUER, H. (1958). Studies on toxoplasmosis. I. Complement fixation tests with peritoneal exudate antigen.—*J. Immunol.* 81, 177-186. 373

Antigen prepared from peritoneal exudate of infected mice had several advantages over antigen from chorio-allantoic membrane of infected chick embryos, although it was more anti-complementary and less reactive than membrane antigens.—R.M.

RUBIN, M. L. (1958). Studies on toxoplasmosis. —*Amer. J. trop. Med. Hyg.* 7, 358-364. 374

R. studied the methylene blue dye test on human sera and chemotherapy of experimental toxoplasmosis in mice. None of three antimalarial drugs had any curative action. Combinations of pyrimethamine and sulphadiazine or sulphapyrazine were the most efficacious. A combination of sulphamylon, sulphamerazine and pyrimethamine was also efficacious.—R.M.

and weak impregnation with silver; nerve fibres were also irregularly swollen, less dense, and reduced in number. During generalization of infection the number of nervous elements was much reduced and the predominant changes were degeneration with lysis, both in and outside aphthae. A month after recovery there was complete restoration of nerve elements. K. suggested that the changes in sensory nerves in non-affected areas would reduce the sensitivity of skin to pain, and that those in nerves supplying blood vessels could be responsible for dystrophic changes in the skin.—R.M.

LÜBKE, A. (1958). Experimentell induzierte Herzveränderungen erwachsener Mäuse nach MKS-Infektion. [Heart lesions in adult mice infected with foot and mouth disease virus.]—*Mh. VetMed.* 13, 19-20. 377

Mice over 6 weeks old were given toxic doses of urethan i/p for several days and then infected with F. & M. disease virus, Type O<sub>1</sub>. Heart lesions developed on the third day after infection, and were of the same nature as those seen in unweaned mice infected with the virus. —M.G.G.

DIMOPOULLOS, G. T. & FELLOWES, O. N. (1958). Electrophoretic composition and antibody studies on anti-foot-and-mouth disease guinea pig serum.—*J. Immunol.* 81, 199-203. [Authors' summary modified.] 378

Anti-foot-and-mouth disease g.pig serum



was subjected to paper electrophoretic analyses. Analyses of whole immune sera for protein composition revealed no significant differences when compared with normal sera.

No relationship was demonstrated between protein composition, virus neutralizing and complement-fixing antibody titres. In fractions of sera tested for virus-neutralizing antibody activity the  $\beta$  and  $\gamma$ -globulins were capable of neutralizing all of the virus infectivity. Complement-fixing activity was found only in the  $\gamma$ -globulin fraction of highest mobility. Evidence is presented that the complement-fixing and virus-neutralizing antibodies are two distinct antibodies.

LUCAM, F. & FEDIDA, M. (1958). Une nouvelle méthode pour l'appréciation de l'immunité anti-aphteuse. [New quantitative method for assessing immunity to foot and mouth disease.] — *C. R. Acad. Sci., Paris* **247**, 549-552. 379

An "index of protection" was calculated by dividing the virus titre of unvaccinated cattle by the titre of vaccinated cattle, following inoculation into the tongue of  $10^4$  LD<sub>50</sub> of virus.—R.M.

ZUNKER, M. & BULLING, E. (1958). Untersuchungen über einen Tollwutimpfstoff nach Hempt. [Investigation of the Hempt rabies vaccine.] — *Arch. exp. VetMed.* **12**, 6-28. 380

Since the second world war rabies in Germany has been chiefly in foxes and other wild animals, only 4% of cases being in dogs. A report is given of the testing of a commercial vaccine on lab. animals and on dogs. The Hempt vaccine was an ether-extracted phenolized 10% suspension of rabbit or sheep brain and spinal cord (two-thirds brain, one-third cord) supplied in 4-ml. ampoules. Results in lab. animals were discordant. 53 dogs were vaccinated, 42 were controls. The vaccine was given as injections of 4-8 ml. at 7-day intervals. All animals were subsequently challenged with 1/10, 1/100, or 1/1,000 dilutions of fixed virus, 1 ml. i/m in the neck at intervals from 14 to 30 days after inoculation. The results were very poor. A number of the vaccinated dogs died within 9 days from rabies, and a number of the controls withstood the challenge, 2 of them even in 1/10 dilution. In some of the vaccinated dogs virus was found in the salivary glands as well as in the brain. Some of the survivors withstood a second i/m inj., and 5 which received two 4-ml. injections of 1/1,000 dilution even stood a subsequent subdural challenge. The authors consider that the vaccine in the doses advised in the makers' brochure does not give protection; more than

two injections are necessary, which would not be satisfactory in any prevention campaign. [There is no reference to the nature of the virus isolated from the salivary glands. A note on its incubation period when passaged, and the possible presence of Negri bodies in the passaged animals would have been of considerable interest].—W. K. DUNSCOMBE.

HOLT, S. J. & EPSTEIN, M. A. (1958). Cytochemical and electron microscopical observations on substances associated with fluorocarbon purified vaccinia virus.—*Brit. J. exp. Path.* **39**, 472-479. 381

The present findings indicate that if deoxyribonuclease digestion is applied to vaccinia virus pellets prepared by the method of Epstein [*Brit. J. exp. Path.* **39**, 436 (1958)], it will enable contaminating deoxyribonucleic acid (DNA) to be removed so that subsequent investigations of the virus nucleic acid may be facilitated. The course of such digestion experiments can be controlled by performing the Feulgen reaction from time to time on sampled smears until a negative result is obtained. There is little likelihood of viral DNA being removed during this process.—R.M.

PLOWRIGHT, W. & FERRIS, R. D. (1958). The growth and cytopathogenicity of sheep-pox virus in tissue cultures.—*Brit. J. exp. Path.* **39**, 424-435. [Survey of paper (p. ii) modified.] 382

A strain of sheep pox virus was grown in monolayer cultures of sheep, goat and ox cells. The virus was more extensively cytopathogenic for testis than for kidney cultures and was passaged serially with good yields and no attenuation of virulence for sheep. Although neutralization was incomplete, it was possible to demonstrate and measure, by this method, antibodies in the sera of convalescent sheep.

I. ISAACS, A., BURKE, D. C. & FADEEVA, L. (1958). Effect of interferon on the growth of viruses on the chick chorion.—*Brit. J. exp. Path.* **39**, 447-451. 383

II. BURKE, D. C. & ISAACS, A. (1958). Some factors affecting the production of interferon.—*Ibid.* 452-458. [Authors' summaries modified.] 384

I. Interferon inoculated on the chick chorion diffused through to the neighbouring allantoic cells and interfered with their ability to support the growth of influenza virus. The same dose of interferon greatly inhibited the development of pocks and of haemagglutinin by vaccinia, but did not significantly interfere with



pock development by herpes simplex virus. Cow pox and ectromelia were inhibited to about the same extent as vaccinia virus.

II. The production of interferon by influenza virus was investigated. Following a single inoculum of ultra-violet irradiated virus, chick chorio-allantoic membranes produced good yields of interferon over a period of 3 days.

Live influenza virus did not produce interferon in the first 24 hours, *i.e.*, during the peak of virus multiplication. After the first 24 hr. when virus production was falling off interferon accumulated. However, live virus produced interferon within the first 24 hr. on membranes previously treated with heated virus.

Interferon was produced by incubating chick chorio-allantoic membranes with irradiated influenza B, fowl plague and Newcastle disease viruses, and in small amounts, by irradiated influenza A virus incubated with monkey kidney and HeLa cells.

BAUER, D. J. (1958). **The chemotherapeutic activity of compounds of copper, rhodium and certain other metals in mice infected with neurovaccinia and ectromelia viruses.**—*Brit. J. exp. Path.* **33**, 480-489. [Author's summary modified.] **385**

B. described chemotherapeutic tests in mice infected with neurovaccinia and ectromelia viruses. Compounds of copper and rhodium had a therapeutic effect in both infections. Indium trichloride was effective against neuro-vaccinia. Platinum chloride had some effect against both infections, and zinc sulphate was active against ectromelia. The two infections differed in their response to indium and zinc, despite their close antigenic relationship. No therapeutic effect was observed with copper and rhodium compounds against 23 other viruses.

HESS, A. D. & HOLDEN, P. (1958). **The natural history of the arthropod-borne encephalitides in the United States.**—*Ann. N.Y. Acad. Sci.* **70**, 294-311. **386**

Of the 3 principal arthropod-borne viruses causing encephalitis in man in the U.S.A., Western equine (WEE) and St. Louis (SLE) occur primarily in the 22 western States whereas Eastern equine (EEE) occurs primarily in the Atlantic and gulf coast States. Wild birds appear to serve as natural hosts for all three, whilst man and horses are dead-end hosts. Other mammals, both wild and domestic, are inapparent dead-end hosts. The mosquito, *Culex tarsalis*, is believed to serve as the primary sylvan and endemic vector for WEE and rural SLE, whilst mosquitoes of the *C. pipiens* complex appear to

be the primary vector for urban SLE with both birds and mammals as possible reservoirs. For EEE, *C. melanura* seems to be the primary sylvan vector. Direct bird to bird transmission of EEE has been proved amongst pheasants. Overwintering reservoirs may be either the mosquito vectors or avian hosts. Control of vertebrate reservoirs and vectors offers promise in limiting epidemics in man and domestic animals.—A. ACKROYD.

GRESSER, I., HARDY, J. L., HU, S. M. K. & SCHERER, W. F. (1958). **Factors influencing transmission of Japanese B encephalitis virus by a colonized strain of *Culex tritaeniorhynchus* Giles, from infected pigs and chicks to susceptible pigs and birds.**—*Amer. J. trop. Med. Hyg.* **7**, 365-373. **387**

*C. tritaeniorhynchus* is the principal mosquito naturally infected in Japan by Japanese encephalitis virus. Laboratory colonies, bred for 12 to 17 generations, readily transmitted the virus from chick to chick and from pig to pig. Mosquito infection and transmissions followed ingestion of blood containing as few as 3 lethal doses for mice in 0.04 ml.—R.M.

HAMMON, W. MCD., SATHER, G. E. & MCCLURE, H. E. (1958). **Serologic survey of Japanese B encephalitis virus infection in birds in Japan.**—*Amer. J. Hyg.* **67**, 118-133. **388**

Virus neutralization tests were performed on sera from 1,705 birds of 154 species captured on the 3 main islands of Japan: 337 sera were positive. Positive results occurred in a wide variety of species, but ducks of all species were negative.—R.M.

BOSSE, R. (1958). **Über das Vorkommen von neutralisierenden Antikörpern gegen Coxsackieviren bei Haustieren. [Incidence of neutralizing antibodies against Coxsackie viruses in domestic animals.]**—*Z. Hyg. InfektKr.* **144**, 454-459. **389**

The sera of 21 horses, 13 cattle, 13 pigs and 3 sheep were tested for neutralizing antibodies against Coxsackie virus, types A<sub>2</sub>, A<sub>10</sub>, and B<sub>1</sub>. Positive reactions were observed in all four species, especially the pigs, 12 of which were positive and only one negative.—M.G.G.

BEATON, W. G. (1957). **A comparative survey of the incidence of rinderpest in Africa in the years 1953 and 1956.**—*Bull. epiz. Dis. Afr.* **5**, 483-488. [In French. pp. 555-558.] **390**

Two maps show the incidence of rinderpest in 1953 and in 1956. The maps were based on information contained in monthly returns from



most countries south of the Sahara, submitted to the Inter-African Bureau for Epizootic Diseases. Progress in the control of rinderpest was discussed.—R.M.

I. HAIG, D. A. (1957). **Lumpy skin disease.**—*Bull. epiz. Dis. Afr.* **5**, 421-430. [In French. pp. 513-523.] **391**

II. ALEXANDER, R. A., PLOWRIGHT, W. & HAIG, D. A. (1957). **Cytopathogenic agents associated with lumpy-skin disease of cattle.**—*Ibid.* 489-492. [Summary in French. pp. 559-560.] **392**

I. A review, with mention of unpublished work on attempts to propagate the causal agent in monolayer cultures of calf kidney cells. In the first attempt the cultured cells were damaged, but the damage appeared to be caused by another agent unrelated to lumpy skin disease but present in skin lesions: the cytopathogenic effect was not neutralized by serum from cattle recovering from lumpy skin disease. The virus of lumpy skin disease was subsequently isolated alone: it induced syncytial lesions in the cells, and cell nuclei contained inclusion bodies which stained with haemalum-eosin. Material from the 2nd and 4th passages caused typical lumpy skin disease in cattle, and the virus was neutralized by immune serum. Subcutaneous inoculation of day-old mice with the virus caused localized areas of cutaneous congestion not only at the site of inoculation, 2-5 mm. in diam., which developed into hairless patches. Most of the mice became stunted and some died before they were a fortnight old.

II. A preliminary account of attempts to propagate the virus of lumpy skin disease in cell cultures. Nine different agents were isolated and they could be divided into 3 groups. The first group were non-pathogenic for cattle, sheep, rabbits and mice and were believed to be "orphan" viruses. The second group caused syncytial lesions in cell cultures and reproduced the disease when inoculated into cattle. The third group had a delayed cytopathogenic action without syncytium formation and caused fever with necrosis at the site of injection in cattle.—R.M.

HYSLOP, N. ST. G. & HEBELER, H. F. (1958). **Pseudo lumpy-skin disease in Great Britain.**—*Vet. Rec.* **70**, 731-732. **393**

The occurrence in Somerset of isolated cases of a condition clinically resembling lumpy skin disease is reported and the course of the condition described in a 4-year-old Shorthorn cow. When seen 6 weeks after first observation of lesions by the owner, the cow was in good condition with normal milk yield and tempera-

ture. Numerous plaque-like nodular lesions of 1-5 cm. diameter covered most of the area of back, neck and perineal region, and several were present on the udder. In some areas nodules appeared along the lymphatics. The skin of individual nodules showed stiffly elevated hair, slight exudation of reddish fluid from pores and hair follicles, and dark purplish lesions in non-pigmented areas. Early lesions were similar to those of classical lumpy skin disease, while older lesions were larger, softer and tended to ulcerate. Both prescapular lymph nodes were slightly enlarged.

24 days later no increase in the number of nodules was seen, but many lesions were larger, ulcerated, necrotic, or covered with scabs which on removal caused considerable haemorrhage. Some sloughing had left shallow granulating ulcers. Only the left prescapular and precrucial lymph nodes were enlarged. Blood examination showed normal cellular constituents.

69 days after the first examination the cow was slaughtered and with the exception of the swollen prescapular and precrucial lymph nodes, lesions were confined to the skin and subcutis. Histologically lesions consisted mainly of mononuclear and reticulum type cells, and appeared neoplastic rather than inflammatory.

—A. B. PATERSON.

BULL, L. B. & MURNANE, D. (1958). **An outbreak of scrapie in British sheep imported into Victoria.**—*Aust. vet. J.* **34**, 213-215. **394**

Field and laboratory observations of the outbreak, and the eradication procedures adopted, are described. The stud from which the sheep were imported had been free from scrapie, but an outbreak began there at about the same time as this one.

Dystokia was a common occurrence among the imported ewes and may have been associated with the scrapie.—D. S. ROBERTS.

WEISS, K. E. (1957). **Rift Valley fever — A review.**—*Bull. epiz. Dis. Afr.* **5**, 431-458. [Summary in French. pp. 525-527.] **395**

A comprehensive review, including references to work not yet published by the author, such as the propagation of the virus in tissue cultures of lamb kidney, and the stability of the virus.—R.M.

WEISS, K. E. (1957). **Wesselsbron virus disease.**—*Bull. epiz. Dis. Afr.* **5**, 459-465. [Summary in French. p. 529.] **396**

A general account of the disease. W. mentioned that he has employed fluid from tissue cultures of lamb kidney, infected with the virus,



as antigen for the complement-fixation test. Viraemia in sheep was of relatively brief duration and maximum conc. of virus in the blood occurred at the height of fever.—R.M.

PEHL, K.-H. & SCHULZE, W. (1958). Die Abtötung des Schweinepestvirus durch die Abwasserchlorung. [**Destruction of swine fever virus by chlorination of sewage.**] — *Arch. exp. VetMed.* **12**, 125-133. 397

Chlorine, at a concentration of 4 mg. per litre, inactivated swine fever virus within 2 hours in a 1:100 dilution of infectious cerebrospinal fluid. High concentrations, however, were needed to inactivate the virus in dilutions of infectious whole blood, serum, and spleen suspension. It is concluded that chlorine, at concentrations of 2-30 mg./litre, would not inactivate swine fever virus in raw sewage with a high content of proteinous and organic substances, but would in treated sewage provided that the protein content did not rise above 0.02-0.04%. —M.G.G.

ZIMMERMANN, T. (1958). Experimentelle Untersuchungen über das Auftreten von Aggregaten beim Virus der ansteckenden Schweinelähmung (Teschener Krankheit). [**Occurrence of aggregates of virus in Teschen disease.**] — *Z. Naturf.* **13b**, 493-509. 398

Z. investigated the stability of solutions of the virus derived from tissue cultures. Virus in solutions prepared by a single dilution method in which 0.1 ml. virus suspension was placed in a litre of buffered saline, was more stable than in solution prepared by a multiple dilution method involving the pipetting of solution through a series of tubes. This phenomenon was caused by the formation of aggregates of virus. Addition of large molecules in the form of protein to a virus solution delayed de-aggregation and improved stability.—R.M.

MITCHELL, D. & CORNER, A. H. (1958). An outbreak of "inclusion-body" rhinitis in pigs. — *Canad. J. comp. Med.* **22**, 199-202. 399

The clinical picture of an outbreak of rhinitis in the Ottawa Valley is described, in which histopathological studies revealed the presence of "inclusion-bodies" essentially similar to those demonstrated in Gt. Britain in 1955 [*V.B.* **26**, 565].

Transmission experiments were inconclusive except that atrophic rhinitis was produced with material from young pigs whose litter mates had previously been shown to be affected with "inclusion-body" rhinitis.

The authors discussed the clinical observa-

tions and aetiology of the condition particularly with regard to its similarity to true atrophic rhinitis.—R. V. L. WALKER.

MCCLAIN, M. E., HACKETT, A. J. & MADIN, S. H. (1958). **Plaque morphology and pathogenicity of vesicular exanthema virus.** — *Science* **127**, 1391-1392. 400

The authors described the formation of plaques on monolayer cultures of pig kidney cells by seven strains of vesicular exanthema virus. At 96 hours after infection, large plaques (5-10 mm. diam.) and minute plaques (about 1 mm. diam.) were seen: the proportion of large to minute varied with the strain of virus. With 3 strains the size of the "large" plaques was only 2-3 mm. The possibility that some plaques might be produced by a contaminating virus was excluded. The virus which produced large plaques was highly virulent for pigs, whereas that which produced minute plaques was either avirulent or of low virulence.—R.M.

LEVADITI, J. C., VALLÉE, A., VIRAT, B. & GROULADE, P. (1957). Origine virale d'une pneumopathie aiguë contagieuse du chien. [**Viral nature of an acute contagious respiratory disease of dogs.**] — *C. R. Soc. Biol., Paris* **151**, 1822-1826. 401

A bitch and 6 puppies died from bronchopneumonia. One of 3 dogs, inoculated intratracheally with a suspension of organs from the bitch, died from bronchopneumonia within 8 days. No bacteria could be isolated from affected lungs. Intracytoplasmic inclusions were seen in macrophages and histiocytes of lung, in liver cells, and in sections of lung and liver stained by Mann's method.

The disease differed from the rhinotonsillitis described by Fontaine & others [*V.B.* **28**, 133].

The authors do not give their reasons for excluding distemper virus as the cause of this condition, but in a clinical account [*Bull. Acad. vet. Fr.* **30**, 485] they state that the intracellular inclusions differed from those observed in the known virus diseases of dogs.—R.M.

BEARCROFT, W. G. C. & JAMIESON, M. F. (1958). **An outbreak of subcutaneous tumours in rhesus monkeys.** — *Nature, Lond.* **182**, 195-196. 402

An outbreak of subcutaneous tumours is described in a colony of rhesus monkeys in Lagos, Nigeria. The tumours were infectious and a virus has been implicated. One young dog-faced baboon became infected but species of West African monkeys in contact were not affected.



Tumours occurred most frequently on the lower portion of the limbs or dorsal aspect of the feet and hands, otherwise on the face or ears, never on the trunk. There was no general disturbance unless suppuration of the tumours took place. Affected animals recovered spontaneously, the growth sloughing away and the area healing by granulation. The disease was transmitted by subcutaneous inoculation of lightly centrifuged emulsions of tumour material to healthy rhesus monkeys and to two West African guenon monkeys. Other transmission experiments were unsuccessful.—R. N. FIENNES.

HOFFERT, W. R., BATES, M. E. & CHEEVER, F. S. (1958). **Study of enteric viruses of simian origin.** — *Amer. J. Hyg.* **68**, 15-30. [Authors' summary modified.] 403

The intestinal viral flora of monkeys was investigated by means of the inoculation of monkey-kidney cell cultures and unweaned mice; 169 strains of virus were isolated from 195 animals, most of which had diarrhoea. The majority of strains fell into 13 serological types, some of which appeared to be identical with viral agents isolated from monkeys by other investigators. No serological relationships were demonstrated between these agents and members of the poliomyelitis, ECHO or Coxsackie groups. Comparable isolation rates were observed in normal animals and in those with diarrhoea; no significant association between any of these viral agents and the various types of dysentery bacilli was demonstrated. Antibodies against some of the 13 serological types were detected in a variable percentage of the monkey sera studied. No causal relationship was demonstrated between these agents and the occurrence of diarrhoea.

HULL, R. N., MINNER, J. R. & MASCOLI, C. C. (1958). **New viral agents recovered from tissue cultures of monkey kidney cells. III. Recovery of additional agents both from cultures of monkey tissues and directly from tissues and excreta.** — *Amer. J. Hyg.* **68**, 31-44. [Authors' summary modified.] 404

Eighteen additional simian viruses were isolated and classified since the first report in this series [*V.B.* **26**, 2619]. Observations on the most likely host tissues for some of these agents were reported. The incidence of virus recovery from tissue culture and central nervous system tissues of monkeys was described and the seasonal variations in the total number of viruses encountered and the variations in specific type of viruses were mentioned. The significance of these agents to the investigator working with

primary monkey cell cultures, to tissue culture-produced vaccines and to public health was discussed.

JACOTOT, H., VALLÉE, A. & VIRAT, B. (1958). Sur l'immunisation contre le virus du myxome infectieux par inoculation de virus du fibrome de Shope. [**Immunization against myxomatosis by inoculation of Shope's fibroma virus.**] — *Ann. Inst. Pasteur* **94**, 282-293. [Summary in English.] 405

The behaviour of French breeds of domestic rabbit on challenge with myxoma virus between 3 days and a year after inoculation of Shope's fibroma virus depended on several factors, among which the degree of resistance conferred by fibroma virus and differing susceptibility to myxoma virus were important. Immunity to myxoma virus was first established 4 days after inoculation of fibroma virus and it was maintained for about a year. On second challenge with myxoma virus some weeks or months after the first challenge some rabbits were completely resistant, while others succumbed.—R.M.

GRAUSGRUBER, W. (1958). Untersuchungen zum biologischen und serologischen Nachweis des Virus der Newcastle-Krankheit und der klassischen Geflügelpest. [**Biological and serological diagnosis of Newcastle disease and fowl plague.**] — *Wien. tierärztl. Mschr.* **45**, 76-114. [Summaries in English and French.] 406

G. reviewed the various methods of demonstrating Newcastle disease and fowl plague and gave details of his own experiments. Inoculation of suspected material into fowls and embryonated eggs and subsequent examination of haemagglutination titres were sensitive methods but time-consuming and expensive. Of the serological methods, the agglutination test, using fowl erythrocytes sensitized by suspensions of infected organ material, gave the most reliable results in dead birds.—M.G.G.

HANSON, R. P. & BRANDLY, C. A. (1958). **Newcastle disease.** — *Ann. N.Y. Acad. Sci.* **70**, 585-597. 407

Newcastle disease, first reported in Indonesia in 1926, is now world wide. The virus is stated to be resistant to temp., putrefaction, drying, moisture and light, and substantially resistant to some chemical disinfectants in common use. It has great variability in pathogenicity and in tissue tropism. The primary source of infection for chickens is inhalation of infective droplets from chickens in the initial stages of the disease, but infection can be spread by ingestion and by coitus. In man, inhalation



of virus is the principal route of infection. Conjunctivitis lasting 3-21 days is the usual manifestation. Infection may or may not result in detectable antibodies. Apart from the economic losses due to the disease, control measures are necessary to prevent the possible emergence of a mammalian type of the virus capable of perpetuation in man.—A. ACKROYD.

HAMANN, I. (1958). Untersuchungen von Hühnerseren mit dem Hämagglutinationshemmungstest im Vergleich mit einem lyophilisierten Geflügelpestserum im Rahmen der staatlichen Prüfung von Geflügelpestimpfstoffen. [Testing of Newcastle disease vaccines. Examination of fowl sera with the haemagglutination-inhibition test and comparison with a lyophilized Newcastle disease serum.]—*Mh. VetMed.* 13, 99-102. 408

The haemagglutination-inhibition test was carried out on 532 fowl sera, and the results were compared with those obtained with a freeze-dried Newcastle disease immune serum. Of 127 fowls tested before immunization against Newcastle disease, all were negative. Of 149 fowls tested 14 days after s/c immunization with commercial adsorbate vaccines 118 (79%) were negative; 79 (67%) of these negative reactors were immune to experimental infection, and the 31 positive reactors were all immune. Of 38 fowls tested 14 days after immunization with adsorbate vaccines prepared by the author 14 (37%) were negative; all 38 were immune. Of 68 fowls inoculated s/c with Hertfordshire live vaccine 27 developed positive titres and 41 remained negative; 7 of these 41 were immune. 25 birds were placed in contact with those given live vaccine; 7 of them became positive. Of 125 birds that were immunized and later infected i/m with Newcastle disease virus 121 had positive titres. Their titres were higher than those of birds that were merely immunized. It is concluded that, because of the high percentage of negative reactors, this serological test cannot replace challenge infection in the evaluation of vaccines against Newcastle disease.—M.G.G.

ZURECK, F. (1958). Prüfung der Immunität von an Geflügelpest erkrankten und natürlich durchseuchten Hühnern sowie deren Nachkommenschaft mit Hilfe des Hämagglutinationshemmungstestes. [Examination of immunity to Newcastle disease in naturally infected fowls and their progeny, by the haemagglutination-inhibition test.]—*Mh. VetMed.* 13, 134-142 & 171-174. 409

Haemagglutination inhibition titres of up to 1:640 were demonstrated in 8 fowls from flocks

naturally infected with Newcastle disease. In the course of the next few months the titres fell to between 1:80 and 1:160. In one bird, however, the original titre was only 1:20 and this fell to 1:5. Six of the fowls, including the one with the low titre, were then re-infected experimentally with a laboratory strain of virus. All were immune, and the titres rose by only one or two dilutions. Young birds, the progeny of infected fowls, had no immunity against experimental infection, nor were any signs of congenital infection seen.—M.G.G.

KOHN, A. (1958). Quantitative aspects of alimentary infection by Newcastle disease virus. — *Poult. Sci.* 37, 792-796. [Author's summary.] 410

About  $10^6$  e.i.d.<sub>50</sub> of a virulent strain of NDV (HP) were required to initiate an infection by the alimentary route (inoculation into the crop, or feeding of virus in gelatine capsule), while only  $10^3$  to  $10^4$  doses were sufficient for infection through rectum and cloaca. When virus is brought into contact with the contents of a gizzard (pH=2.6), its viability is reduced a thousand times. It is concluded that the infection by the alimentary route is initiated in the intestines below the gizzard, by the fraction of the virus which survives the acid inactivation in the gizzard.

RAGGI, L. G. & LEE, G. G. (1958). Influence of age and congenital immunity upon immunization with an avian infectious bronchitis vaccine.—*J. Immunol.* 81, 155-160. [Authors' summary modified.] 411

Chicks with or without a high titre of congenital antibodies to infectious bronchitis virus were vaccinated at 6 days or 2 months of age. The serological and immune responses indicated that both youth and congenital immunity were important factors in preventing a satisfactory response to this vaccinal strain of virus. Discrepancies between the serological response and the response to challenge were noted in the younger birds.

KINGSBURY, F. W. & JUNGHER, E. L. (1958). Indirect transmission of infectious laryngotracheitis in chickens.—*Avian Diseases* 2, 54-63. 412

The authors traced the spread of an outbreak in and around a small town in Connecticut. Very careless disposal of carcasses of affected fowls, rat infestation, and travelling caponizing teams were responsible in most cases. —R.M.



DELAFLANE, J. P. (1958). **Ornithosis in domestic fowl: newer findings in turkeys.**—*Ann. N.Y. Acad. Sci.* **70**, 495-500. 413

The major lesions of psittacosis in turkeys are caseofibrinous pericarditis, perihepatitis, and exudates in the serous sacs, pneumonia, and splenomegaly. In experimental infections, mortality varied from 100% in week-old poults to 20% in 12 to 24-week-old birds. The incubation period was 4-7 days. Chlortetracycline prophylactically at the rate of 400 g. per ton of feed suppressed symptoms and lesions in 3-week-old poults whilst 200 g. per ton for 3 weeks suppressed a naturally occurring infection in a farm flock. No evidence of egg transmission has been found. Natural reservoirs for the virus may be water-fowl and sea-gulls. Detection of infection by Benedict's direct complement-fixation test has given an 85% correlation with the indirect c.f. test, but non-specific positive reactions are encountered frequently.—A. ACKROYD.

MONREAL, G. (1958). Untersuchungen über den direkten und indirekten Virusnachweis bei der Ornithose der Tauben. [Studies on the direct and indirect demonstration of virus in ornithosis in pigeons.]—*Zbl. VetMed.* **5**, 273-294. [Summaries in English, French and Spanish.] 414

Ornithosis (psittacosis) virus was demonstrated, by inoculation of mice, in the nasal and ocular secretions and faeces of pigeons with both acute and latent infection. Three passages in mice were usually necessary before the characteristic lesions and elementary bodies developed. The chief clinical symptom in infected carrier pigeons was coryza. C.f. titres appeared within 12 days after experimental infection, reached a peak after about 50 days, then slowly declined and disappeared within 150 days. Re-infection with a different strain of virus at 152 days caused renewed titres but they were slower to develop and less pronounced. Of 504 carrier pigeons obtained from 102 flocks, 172 birds (77 flocks) were serologically positive and 31 (8 flocks) were doubtful.—M.G.G.

TOPCHII, M. K. (1958). [Interference between the viruses of Newcastle disease and vaccinia.]—*Voprosy Virusologii* **3**, No. 5 pp. 302-304. [In Russian.] 415

Interference occurred when the "Kishinev" strain of N.D. virus and vaccinia virus were inoculated simultaneously on to the chorio-allantoic membrane of chick embryos, and also when N.D. virus was inoculated between 20 and 48 hours after the vaccinia virus. In the latter case some of the embryos developed a double

infection. When this mixture of viruses was passaged, N.D. virus was suppressed by vaccinia virus.—R.M.

KOPROWSKI, H. (1958). **Counterparts of human viral disease in animals.**—*Ann. N.Y. Acad. Sci.* **70**, 369-382. 416

Aspects of animal viral diseases are presented in a schematic form for comparison with human viral entities which might be considered their counterparts. The diseases discussed include infections of the central nervous system (Arbor A, Japanese B, and louping-ill encephalitides), poliomyelitis-like diseases (Tesch disease, Theiler's virus infection of mice, poliomyelitis), forms of hepatitis, respiratory viral infections, gastro-intestinal infections, infections inducing foetal damage, vesicular diseases and papillomata. There is evidence that there is a possible antigenic relationship between the viruses of measles, distemper and rinderpest.

—A. ACKROYD.

HSIUNG, G. D. & MELNICK, J. L. (1958). **Orphan viruses of man and animals.**—*Ann. N.Y. Acad. Sci.* **70**, 342-360. Discussion: pp. 360-361. 417

Developments in the research on enteric cytopathogenic orphan viruses of human, simian and bovine origin are reviewed. Improved tissue culture methods have enabled the slow-growing plaques of the orphan viruses to be demonstrated. Differences in the patterns and rates of production of plaques enable them to be differentiated from poliovirus and Cocksackie virus plaques and to be grouped according to host susceptibility and plaque patterns. Correlation between the plaque characteristics, host cell range and antigenicity has been observed with some enteric monkey orphan viruses. The finding of naturally occurring substances in bovine sera which neutralized all 3 types of poliovirus has led to the suggestion that bovine orphan viruses may be related to poliovirus, but Takemori *et al.* in Japan have shown that these bovine poliovirus inhibitors can be distinguished from true antibodies of poliovirus.

—A. ACKROYD.

QUERSIN-THIRY, L. (1958). **Action of anti-cellular sera on virus infections. I. Influence on homologous tissue cultures infected with various viruses.**—*J. Immunol.* **81**, 253-260. [Author's summary.] 418

Rabbit anti-HeLa sera and anti-monkey kidney culture sera completely protected the homologous cultures against the cytopathogenic effect of poliomyelitis virus (MEF1), if the sera



were used at subagglutinative concentrations. At such concentrations cells multiplied normally in spite of the presence of both antiserum and virus. The protection, at least in part, resulted from an inhibiting effect on the attachment of virus to antibody-treated cells.

Susceptibility to this protective action differed greatly with different strains. Examples of strains which were not susceptible include one strain of Newcastle disease and four types of Coxsackie B virus. Susceptibility equal to that of MEF1 was shown by four other strains of poliomyelitis virus (two virulent, two avirulent). Susceptibility greater than that of MEF1 was shown by three types of Coxsackie A (smaller doses of antiserum were required to achieve protection). Susceptibility was variable among 13 types of the ECHO group. No protection was obtained against diphtheria toxin. If protective action occurred, the presence or absence of complement had no effect on the susceptibility of virus.

When filter paper disks soaked in anti-cellular serum were laid on agar in Petri dishes which had been prepared according to the Dulbecco technique, viruses such as poliomyelitis and ECHO 9 strains did not form plaques in an area surrounding the disk. No such protected area was formed when Newcastle disease was tested.

BLINOV, P. N. (1958). [Distribution of *Rickettsia burneti* in nature.]—*J. Microbiol., Moscow* 29, No. 8 pp. 85-88. [In Russian.] 419

The organism was present in milk, nasal mucus and excreta of infected cattle: in excreta

it was present for at least 90 days after the initial diagnosis of Q fever. It was widely distributed in manure, dust, pasture and water on infected farms.—R.M.

SHIFRIN, I. A., ROZHKOVA, F. V. & TRUBA, I. V. (1958). [Immunization of sheep against Q fever.]—*J. Microbiol., Moscow* 29, No. 8 pp. 97-101. [In Russian.] 420

In a flock in the Tashkent district, 109 of 462 ewes and 9 of 272 lambs reacted to complement-fixation tests on sera: in 8 of the lambs the maximum titre was 1:8. Six lambs inoculated s/c with 3 doses at 10-day intervals of a formalized suspension of *R. burneti* developed high titres of c.f. antibody in the serum, which were greatest after 6-8 weeks, compared with a peak 5-8 months after infection with live organisms. 35 days after the last inoculation each sheep was inoculated with a million g.p.i.-infective doses of the organism, either i/m or intratracheally. All sheep appeared to resist the challenge; 2 developed transient fever 2-3 days after challenge. Antibodies were present in low titre in serum from lambs born to infected ewes; the titres disappeared after 2-4 months.—R.M.

LASHKEVICH, V. A. (1958). [Incidence of *Rickettsia burneti* in domestic animals in an area of Kirgizia where Q fever is endemic.]—*J. Microbiol., Moscow* 29, No. 9 pp. 107-109. [In Russian.] 421

Complement-fixing antibodies were detected in sera from 133 of 485 cows, 53 of 186 goats, 13 of 21 sheep, and from a pig, a donkey and a camel. Two strains of rickettsia were isolated from 303 milk samples.—R.M.

See also absts. 299 (bacteriophage typing of mastitis staphylococci); 595 (report, Union of South Africa); 596 (report, Nigeria); 597 (report, Northern Rhodesia); 598 (report, Tanganyika).

## IMMUNITY

NOSSAL, G. J. V. (1958). Antibody production by single cells.—*Brit. J. exp. Path.* 39, 544-551. [Author's summary modified.] 422

A technique is described for the detection of antibody production by single cells. Cells from regional lymph nodes of rats immunized with *Salmonella adelaide* and/or *S. typhi* were suspended singly in microdroplets at 37° for 4 hours. Antibody liberated by the cells was detected by the specific immobilization of salmonella organisms. Of 416 single cells tested, 56 produced detectable antibody. In 326 single-cell tests from animals immunized with both antigens, no cell was found which produced antibodies against both.

STÖSS, B. (1958). Papierchromatographische Darstellung von Antigen-Antikörper-Reaktionen. I. Mitteilung: Präzipitationen. [Paper chromatographic demonstration of antigen-antibody reactions. I. Precipitation.]—*Zbl. Bakt. I. (Orig.)* 171, 103-116. [Summaries in English, French, Spanish and Russian.] 423

Antigen and antibody (0.1-0.15 ml. of each) were mixed in glass capillary tubes, one end of which impinged on impregnated glass-fibre paper. Precipitate formation on the paper was demonstrated by incorporating amido black as a stain. The test was suitable for antigens composed of carbohydrate, lipid or water-soluble protein.—R.M.



CROWLE, A. J. (1958). **Enhancement by cadmium of double-diffusion precipitin reactions.**—*J. Immunol.* **81**, 194-198. [Author's summary modified.] 424

Low concentrations of cadmium ions specifically enhanced antigen-antibody precipitation. This effect has been studied by incorporating cadmium salts in agar used in a slight modification of Ouchterlony's double-diffusion precipitin technique. Preliminary experiments are reported which characterize the activity of cadmium nitrate upon rabbit and g.pig antisera against tuberculo-protein antigen. Although usually enhancing, at certain very low concentrations cadmium nitrate irreversibly inhibited some antigen-antibody precipitation reactions.

DRURY, A. N. & TUCKER, E. M. (1958). **The relationship between natural and immune haemolysins and incompatibility of <sup>51</sup>Cr labelled red cells in the sheep.**—*Immunology* **1**, 204-216. [Authors' summary modified.] 425

The use of <sup>51</sup>Cr as a label for sheep r.b.c. was tested in 13 sheep. A considerable loss of radioactivity from the circulating blood was noted especially during the first few days, which seemed to be due to the elution of chromium from the r.b.c. This was supported by certain *in vitro* experiments. The method, however, offered a practical possibility for determining the incompatibility of homologous r.b.c.

The strength of the naturally occurring hae-

molysis was determined by a haemolytic test, which should prove useful in selecting bloods for transfusion. The rate of elimination of injected cells was followed before and after immunization against the donor's r.b.c. In most cases the elimination was virtually complete, but in some cases a proportion of the cells remained circulating in the presence of antibody.

DRAY, S. & YOUNG, G. O. (1958). **Differences in the antigenic components of sera of individual rabbits as shown by induced isoprecipitins.**—*J. Immunol.* **81**, 142-149. [Authors' summary modified.] 426

For the induction of iso-antibodies rabbits were injected with normal rabbit sera plus paraffin adjuvants. The titres of iso-antibodies were estimated by precipitin reactions in agar gel and by passive cutaneous anaphylaxis in g.pigs. Iso-precipitins to serum antigens were found, with electrophoretic mobilities corresponding to alpha, beta and gamma globulins. The sera of 90 normal rabbits were tested by diffusion in gel tubes with 6 sera from rabbits which were immune to rabbit serum; some tubes had no precipitin bands and others had one or two. When the reactions between each normal rabbit serum and the 6 immune sera were compared, the 90 rabbits could be divided into 13 groups on the presence or absence of precipitin bands and into 30 groups on the number of bands.

The iso-antibodies did not react with red blood cell antigens in agglutination and adsorption tests.

See also absts. 302 (anthrax); 303-313 (TB.); 315 (John's disease); 317 (swine erysipelas); 325-330 (brucellosis); 333 (leptospirosis); 340 (clostridial antigens); 373 (toxoplasmosis); 375 & 378-379 (F. & M. disease); 380 (rabies); 381 (vaccinia); 382 (sheep pox); 383-384 (interferon) 389 (Coxsackie antibodies in farm animals); 405 (myxomatosis); 406 (diagnosis of Newcastle disease and fowl plague); 408-410 (Newcastle disease); 411 (avian infectious bronchitis); 414 (ornithosis); 415 (interference between Newcastle disease and vaccinia viruses); 420 (Q fever).

## PARASITES IN RELATION TO DISEASE [ARTHROPODS]

WEBBER, L. G. (1958). **Nutrition and reproduction in the Australian sheep blowfly *Lucilia cuprina*.**—*Aust. J. Zool.* **6**, 139-144. [Author's summary.] 427

Carbohydrate, protein, and salts are essential for the development of eggs by *Lucilia cuprina* (Wied.). In the presence of sucrose, each of the following is adequate for egg development: casein, milk, yeast, egg albumen, and gelatin plus L-tryptophan. However, egg development on these foods is slower than on liver. Contrary to previous findings, it is shown that sheep droppings may provide adequate food for the development of eggs in *L. cuprina*, especially droppings from sheep on improved pastures during spring and autumn, when both pasture and faeces have a relatively high protein content.

BEESLEY, W. N. & DAVIES, S. F. M. (1958). **Implantation of warble-fly larvae into experimental animals.**—*Trans. R. Soc. trop. Med. Hyg.* **52**, 301-302. [Authors' abstr. modified.] 428

In an early attempt to demonstrate the life cycle of *Hypoderma*, Koorevaar (1898) removed 1st-instar larvae from beneath the mucous membrane of the oesophagus of cattle and inoculated them into the subcutaneous connective tissue of dogs and goats. 50 years later the transplant technique was being used in rabbits to screen drugs which it was hoped would be effective against the young larvae of *Hypoderma* (Barrett & Wells, 1948), and recent American work has been accelerated with the discovery of a promising systemic organo-phosphorus compound, "Trolene" (Dow ET-57).



At Weybridge, *H. lineatum* larvae from the gullets of cattle were transplanted into rabbits, mice, rats, g.pigs and calves. New information on migration routes and speed of development of the young parasite has been gained, and larvae have now been recovered from rabbits up to 13 weeks after inoculation. Migration usually took place through the fascia immediately under the skin, and excoriations were frequently observed. Larvae which had been implanted into rabbits were found in all parts of the body, e.g. between the ears and round the base of the tail, with occasional individuals in the thoracic cavity, or in the deeper layers of the neck. In both rabbits and calves some of the 1st-instar larvae appeared through the skin of the back, usually 2 to 4 weeks after inoculation, and in one of the calves a 2nd-instar larva emerged through a typical warble swelling.

SPIRYUKHOV, I. A. & MACHUL'SKII, S. N. (1958). [Treatment with hexachlorane and hexachloroethane of sheep infested with *Oestrus ovis* larvae.]—*Veterinariya, Moscow* 35, No. 5, pp. 76-78. [In Russian.] 429

An emulsion consisting of 2% hexachlorane and 10% hexachloroethane in fish oil was injected, after warming, into both the right and the left bulla lacrimalis of 29 sheep with severe *O. ovis* infestation. The needle pierced the skin just behind the lateral canthus, and passing on the inside of the junction of the zygomatic and temporal processes of the malar bone, was aimed at a point 0.5 cm. below the medial canthus. With light pressure the needle penetrated the bulla lacrimalis and small quantities of the emulsion (5-15 ml. at a time) were introduced until this was seen to issue from the nostrils. A few sheep received a second treatment 2-3 days later. Within a fortnight all symptoms disappeared. *O. ovis* infestation can be demonstrated in suspected sheep by placing a gauze bag over the face after treatment. Larvae, if present, will appear in the bag after a few hours.

—M.G.G.

COAKER, T. H. & PASSMORE, R. G. (1958). *Stomoxys* sp. on cattle in Uganda.—*Nature, Lond.* 182, 606-607. 430

*Stomoxys nigra* is the commonest species at Namulonge, Uganda, and bait records show a diurnal activity cycle with peaks around 8-10 a.m. and 3-6 p.m. local time (one hour in advance of sun time). Flies were caught in modified tsetse fly traps placed at up to 10 yards from cattle. Increased emergence of adults follows periods of heavy rainfall during the larval stage of the fly. The local practice of housing

cattle during the hottest part of the day (11 a.m. to 3 p.m.) does not lead to a significant increase in weight gain compared with cattle allowed to graze continuously, and does not repay the cost of the additional effort.—W. N. BEESLEY.

MAHONEY, D. F. (1958). Back-rubbers to kill buffalo fly.—*Qd. agric. J.* 84, 511-515. 431

Tests carried out during two summers in coastal Queensland showed that back-rubbers charged with 5% DDT in dieselene or fuel oil were as effective as periodic spraying with DDT for the control of buffalo fly (*Siphona exigua*). Fuel oil was superior to dieselene. The units were placed near watering points or "camps" where cattle congregated. Details of construction and charging of the rubbers are given. They are economic to instal and their use would eliminate much mustering at times unsuitable (e.g. the wet season) for working cattle.—A. CULEY.

BARRETT, S. (1958). Skin lesions of demodectic mange in the goat.—*Trans. R. Soc. trop. Med. Hyg.* 52, 301. [Author's abst.] 432

In normal goat skin, the epithelium is thin and the hair follicles and sebaceous glands are numerous. On infection with *Demodex caprae* the epithelium is unchanged but the architecture of the sebaceous glands becomes disorganized. They are grossly distended containing desquamated epithelial cells, for the epithelium of the glands has undergone a metaplasia, together with living *Demodex* and disintegrated exoskeletons. Round cells and plasma cells infiltrate the dermis.

LAVOPIERRE, M. M. J. (1958). Some mites responsible for skin disease in birds.—*Trans. R. Soc. trop. Med. Hyg.* 52, 300. [Author's abst. modified.] 433

L. examined feather mites collected from two cases of depluming itch in birds. (a) An English hen, which showed considerable loss of feathers due to plucking, proved to be very heavily infested with *Megnina cubitalis*. This mite does not usually cause feather loss in poultry and the case reported here is thus somewhat unusual. A careful study of the affected bird revealed no other apparent cause of feather loss. (b) A pied crow, *Corvus albus*, collected in the British Cameroons, with severe loss of feathers and some evidence of hyperkeratosis and feather plucking, was heavily parasitized by *Gabucinia delibata* and *Mesalges diaphanoxus*. The feather plucking was probably due to the immature stages of *G. delibata*, which have been recorded (Dubinin, 1956) as developing in the subcutaneous tissues of the host.



HOHORST, W. & BAUER, F. (1958). Alodan, ein neues Insekticid zur Bekämpfung tierischer Ektoparasiten. [*Alodan, a new insecticide for the control of animal ectoparasites.*]—*Dtsch. tierärztl. Wschr.* **65**, 93-98. 434

5, 6-Bis-(chloromethyl)-1, 2, 3, 4, 7, 7-hexachlorbicyclo-hepten is well tolerated by domestic animals and controls fleas, lice, bugs, keds, and many species of mites, but not demodex mites, red mites, house-flies, mosquito larvae, or warbles. It has no effect on ectoparasites or warbles when given systemically.—M.G.G.

I. CASIDA, J. E., GATTERDAM, P. E., KNAAK, J. B., LANCE, R. D. & NIEDERMEYER, R. P. (1958). Bovine metabolism of organophosphate insecticides. Subacute feeding studies with *O,O*-dimethyl 1-carbomethoxy-1-propen-2 yl phosphate. — *J. agric. Food Chem.* **6**, 658-662. 435

II. PLAPP, F. W. & CASIDA, J. E. (1958). Bovine metabolism of organophosphorus insecticides. Metabolic fate of *O,O*-dimethyl *O*-(2,4,5-trichlorophenyl) phosphorothioate in rats and a cow.—*Ibid.* 662-667. [Authors' summaries modified.] 436

I. When fed to cows, this insecticide severely depressed the cholinesterase content of the blood, but did not appear in the milk or tissues. Tests with the radioactive insecticide

confirmed the lack of significant residues in the milk and tissues and showed that it is rapidly detoxicated and excreted as dimethyl phosphoric acid. Calves showed a similar sensitivity. It was hydrolysed by cow, calf, and human plasma to yield dimethyl phosphoric acid.

II. This insecticide is susceptible to hydrolysis at either the methyl-phosphate or phenyl-phosphate bond. Both sites of hydrolysis were demonstrated with alkali and bovine rumen juice and in rats, house-flies and a cow. The oxygen analogue of this insecticide undergoes similar hydrolytic cleavage. The excretory metabolites of the compound and three derivatives were established for rats. Detoxication and excretion of the metabolites took place more slowly in the cow than in rats, but the metabolic pathway was the same in each.

WEIKEL, J. H., JR., LAUG, E. P. & TOMCHICK, R. (1958). Ion movement across the rabbit erythrocyte membrane as affected by chlorinated insecticides.—*Arch. int. Pharmacodyn.* **113**, 261-272. [Authors' summary.] 437

Lindane, DDT, Dieltrin, Methoxychlor and Aldrin inhibit phosphate exchange in rabbit erythrocytes *in vitro*. DDT appears to cause a selective increase in the permeability of erythrocytes to sodium. Aldrin induces a loss of phosphate and potassium from the cell and this may lead to haemolysis.

See also absts. 324 (ticks as disseminators of brucella); 386-387 (arthropod-borne encephalitis); 599 (report, Denmark).

## PARASITES IN RELATION TO DISEASE [HELMINTHS]

OLLERENSHAW, C. B. (1958). Climate and liver fluke disease in Anglesey. — *Trans. R. Soc. trop. Med. Hyg.* **52**, 303. [Author's abst. modified.] 438

Outbreaks of acute fascioliasis in sheep have long been associated with wet summers. An investigation in Anglesey for the period 1948-57 showed a close correlation between the incidence of the disease and climate. The results of P.M. examinations on sheep at Bangor during the period were presented, and these were used to determine the incidence of the disease.

The principal climatic factors which influence the life cycle of *Fasciola hepatica* are temperature and rainfall. Temperature is limiting during late autumn, winter and early spring, whilst rainfall is normally limiting in summer. In wet summers, however, both factors are favourable for the development of a large parasite population, and in such years outbreaks of the disease may be expected.

Analysis of the interaction of these two fac-

tors showed that a single expression may be derived and that this is of use in forecasting the incidence of the disease.

BARKE, A. (1958). Untersuchungen zum anthelmintischen Wirkungsmechanismus des Piperazins. [Studies of the anthelmintic action of piperazine.] — *Dtsch. tierärztl. Wschr.* **65**, 65-68. 439

250 mg. piperazine in 100 ml. Ringer's soln. caused a temporary increase in activity of *Fasciola hepatica*, followed by a gradual decrease. After 5-8 hours the flukes were motionless, and after 24 hours dead. Ox bile and blood serum enhanced the action.—M.G.G.

ENIGK, K. & DÜWEL, D. (1958). Zur Wirksamkeit des "Distan" beim Leberegelbefall. [Efficacy of "Distan" in liver fluke infestation.]—*Dtsch. tierärztl. Wschr.* **65**, 240-242. [Summary in English.] 440

"Distan" (11% piperazine, 15% sodium



glycocholate and 74% water) was administered parenterally to 60 cattle with fascioliasis, 27 receiving a second dose 7 or 8 days later. No decrease was found in the number of *F. hepatica* ova in the faeces, nor was any influence apparent on intestinal helminths. A veterinary surgeon also reported no success in 400 cattle which he had treated.—M.G.G.

I. GAVEL', I. I., KRESAN, A. S. & GONCHARUK, E. G. (1958). [Subcutaneous injection of carbon tetrachloride in fascioliasis of sheep.]—*Veterinariya, Moscow* 35, No. 5. p. 81. [In Russian.] 441

II. SEN'KOV, A. I. (1958). [Should sheep be treated for fascioliasis by subcutaneous injection of carbon tetrachloride?—*Ibid.* p. 81. [In Russian.] 442

I & II. Fascioliasis in sheep was prevented by administration of carbon tetrachloride into the rumen twice a year, once during September to October and again in January or February. Subcutaneous injection, on the other hand, had no effect, and heavy losses occurred.—M.G.G.

VITUSHINSKII, I. F. (1958). [Action of carbon tetrachloride in relation to methods of administration.]—*Veterinariya, Moscow* 35, No. 5. pp. 81-82. [In Russian.] 443

Subcutaneous injection of carbon tetrachloride has no effect on fascioliasis because most of the drug remains at the point of injection and causes septic abscesses and oedema. A small amount diffuses into the blood stream, but most of it is released by the lungs, and only a negligible quantity reaches the liver. Oral administration is recommended.—M.G.G.

SHKLYAEV, I. P., SHCHERBATYUK, V. I. & POLYAKOV, N. N. (1958). [Paris green, an effective drug against *Moniezia* infestation of sheep.]—*Veterinariya, Moscow* 35, No. 5. p. 80. [In Russian.] 444

Trials in 11,672 sheep established that cupric acetoarsenite was 100% effective against *Moniezia*, *Thysaniezia* and *Avitellina* infestations. The doses recommended are: 0.1 g. for lambs 1-2 months old, 0.2 g. for lambs 3-4 months old, 0.3 g. for animals 4-12 months old, 0.6-0.75 g. up to 2 years of age, and 0.75-0.85 g. over 2 years of age. A dose of 1 g. was toxic for yearlings and 1.5 g. was lethal. The drug was given in a bolus of wheat meal.—M.G.G.

SCHMID, R. (1958). Die Echinokokken-Krankheit in der Schweiz, 1926-1955. [Echinococcosis in Switzerland, 1926-1955.]—*Acta trop.*,

Basel, 15, 65-81. [Summaries in English and French.] 445

The incidence and geographical distribution of *E. granulosus* infection in man in Switzerland is recorded. From 1926 to 1955, 127 cases were detected P.M., 89 of the alveolar form and 38 of the locular form. Most of the cases of the alveolar form were in north-east Switzerland. Comparison of these findings with those of Dardel (1927), who reported 126 cases for the period 1901-1925, reveals little change in the incidence and geographical distribution.—M.G.G.

EL-GARHY, M. T. & SELIM, M. K. (1957). Incidence of echinococcosis in camels slaughtered for meat production in Egypt.—*Vet. med. J., Giza* 4, No. 4 pp. 191-200. 446

Of 4,135 slaughtered camels, echinococcus cysts were found in the liver of 302 and the spleen of 13. Pathological changes in affected organs were described. *E. granulosus* was found in 2 of 28 dogs.—R.M.

PULLAR, E. M. & MARSHALL, W. K. (1958). The incidence of hydatids in Victorian cattle.—*Aust. vet. J.* 34, 193-201. 447

The cattle, slaughtered at 9 abattoirs over a period of 2 months, were not a typical sample of either export or home consumption killings. However, an assessment of the overall incidence of hydatids was made.

Of 17,316 cattle examined (representing 1.7% of the total annual kill) 12% were infected. The general incidence in the annual slaughter was estimated to be 7%. Older animals carried greater infections than younger ones and females than males. Organ infection rates were: liver 88.4%, lungs 72.7%, spleen 7.2%, and in other organs, rare. The 'liver : lung' ratio, 1:0.43, is not constant in cattle. Degenerating cysts were more common in older cattle and about 65% of all hydatid larvae showed signs of degeneration.

Multilocular cysts, the majority of which were in the liver, formed 9.7% of all cysts. The specific identity of multilocular and alveolar cysts is discussed. The former were no less fertile than normal cysts.

Scolices were present in 63% of cystic parasites, or 22% of all parasites. Cyst fertility declined with increasing age of the host.

—R. I. SOMMERVILLE.

GEMMELL, M. A. (1958). The efficiency of dichlorophen (2,2-dihydroxy-5,5-dichlorodiphenyl methane) against *Echinococcus granulosus* infestations in dogs.—*Aust. vet. J.* 34, 249-252. 448

Dichlorophen was not highly effective

against *E. granulosus* even when four times the recommended dose was used. It was more effective against *Dipylidium caninum*. There were no untoward effects from large doses. The action of the compound in destroying the cestodes in the alimentary canal makes a true assessment of its efficiency difficult.—H. McL. GORDON.

GEMMELL, M. A. (1958). **Arecoline hydrobromide as a taeniafuge in dogs, with special reference to its use in controlling hydatid disease.**—*Aust. vet. J.* **34**, 207-212. 449

Laboratory experiments on 5 dogs infested with *Echinococcus granulosus* indicated that the efficiency of arecoline hydrobromide may be low unless the dogs purge. P.M. examination of the three animals which had a satisfactory purge showed the efficiency to be more than 95%.

Of 875 country dogs treated with arecoline hydrobromide, 22.5% failed to purge. Re-treatment of 39 dogs within a month of the first treatment reduced the proportion of infested animals by one third and considerably reduced the infestation in each dog. It is suggested that re-treatment at monthly intervals would be necessary before a significant drop in the cestode population was likely to occur.

—R. I. SOMMERVILLE.

SCHAAF, J. & LAMPE, B. (1958). Zur Biologie der Trichinelle. [**Biology of *Trichinella spiralis*.**]—*Zbl. VetMed.* **5**, 135-151. [Summaries in English, French and Spanish.] 450

Hamsters were fed meat infected with *T. spiralis*. Free trichinella were demonstrated in the small intestine 8 hours later, sexually mature forms in 1-2 days, copulating trichinella in 2-3½ days, the first immature forms in 7 days, muscle forms in 8½ days, and infective forms in 19 days. Encapsulation took place 3-5 weeks after infection. A certain immunity was demonstrated in hamsters given repeated doses of infected meat. In rats infective forms were demonstrated 18-20 days after infection. Meat from a pig that died from trichinosis 19 days after infection failed to infect 2 dogs 5 and 7 years of age. [See also *V.B.* **24**, 2819.]—M.G.G.

LEVINE, N. D., KANTOR, S. & TAYLOR, G. D. (1958). **Nematocidal activity of some organic phosphorus compounds against horse strongyle larvae in vitro.**—*Amer. J. vet. Res.* **19**, 299-303. 451

Screening tests for activity against larvae of horse strongyles were continued [see *V.B.* **26**, 2343] and 173 organic phosphorus compounds were tested. 69 of them showed activity at a

conc. of 0.01 M or lower, and they are listed. "Dipterex", "05 1808" and "Dow ET-15" were among the 11 most active compounds.—R.M.

MICHEL, J. F. (1958). **Host resistance to intestinal worms.**—*Trans. R. Soc. trop. Med. Hyg.* **52**, 303. [Author's abstr. modified.] 452

A number of separate manifestations of host resistance occur in nematode infections. It was demonstrated how three of these operate in infections of *Trichostrongylus retortaeformis* in rabbits.

(i) "**Self-cure**" which results in the elimination of adult worms depends on the presence of an adequate "quantity of worm material". Thus, the duration of an infection is inversely related to its size. Similarly, when a second infection is superimposed on one too small to be spontaneously terminated, then whether and how soon self-cure occurs depends on the size of the superimposed infection.

(ii) The "**inhibition of development.**" When infective larvae are administered to a rabbit which has previously experienced infection the development of most is arrested at the end of the 3rd stage. The inhibited larvae resume their development a few at a time and when their growth results in the presence of a certain "threshold value of quantity of worm material" self-cure results and the adult worms, but not the inhibited larvae, are eliminated. Eggs therefore intermittently appear in and disappear from the faeces until ultimately no more inhibited larvae remain.

(iii) "**Protection**" prevents the establishment of newly acquired worms. When rabbits receive regularly spaced frequent doses of infective larvae the number of inhibited late 3rd-stage larvae that they carry increases for some weeks and then abruptly begins to decrease as the larvae administered no longer succeed in becoming established. The number of adult worms present follows a similar course but this population of adult worms is represented by successive groups of worms which develop and are eliminated by "self-cure".

These three mechanisms of resistance were illustrated by a model in which water flowed through a number of tanks. In this, "protection" was represented by a tap which determined whether incoming worms ran to waste or became established as late 3rd-stage larvae. "Inhibition of development" was represented by a second tap which controlled the passage from late 3rd-stage larvae to adult worms. "Self-cure" represented by a siphon removed adult worms whenever the "quantity of worm material" reached a certain threshold value.



POOLE, D. B. R. (1958). *Nematodirus* in lambs: treatment with *n*-butyl *N*-phenyldithiocarbamate.—*Vet. Rec.* **70**, 711. 453

On farms in Caithness, Scotland, oral treatment of lambs in May and again in June with *n*-butyl *N*-phenyldithiocarbamate, with or without phenothiazine, did not prevent severe scouring and mortality in lambs infested with *N. battus* and *N. fillicollis*. This contradicts the findings of Leiper [see *V.B.* **28**, 2922]. Dosing with bephenium embonate on the same farms, however, gave satisfactory results.—M.G.G.

ZUBOV, S. P. (1958). [Treatment of lungworms in calves with an aqueous solution of iodine and procaine.] — *Veterinariya, Moscow* **35**, No. 5 p. 80. [In Russian.] 454

Calves with *Dictyocaulus* infestation, except those with pneumonia, were all cured by i/t inj. of an aq. soln. of iodine in a procaine base with the following composition:—1 g. crystallized iodine, 2 g. potassium iodide, 3.75 g. procaine, and 1500 ml. distilled water.—M.G.G.

DORRINGTON, J. E. (1958). The treatment of lungworm in sheep.—*J. S. Afr. vet. med. Ass.* **29**, 63-64. 455

Treatment of a flock of 250 sheep with cyancethydrizide, administered subcutaneously to coughing sheep and by mouth to the remainder, halted an outbreak of parasitic bronchitis.—R.M.

VAN DER WALL, G. (1958). Zur Frage des pränatalen Spulwurmbefalls beim Schwein. [Prenatal ascariasis in pigs.] — *Tierärztl. Umsch.* **13**, 48-50. 456

Three sows, free from ascarids, were given 600-12,000 infective *A. lumbricoides* ova 21 to 10 days before parturition. P.M. examination of 4 stillborn piglets and 2 piglets killed shortly after birth, and faecal examinations in the remaining 17 piglets up to the age of 10 weeks revealed no signs of prenatal infection. The sows remained free from ascariasis during the experiment; it is considered that they were immune because of previous infection.—M.G.G.

WEBSTER, G. A. (1958). On prenatal infection and the migration of *Toxocara canis* Werner, 1782 in dogs. — *Canad. J. Zool.* **36**, 435-440. 457

The author studied the migration pattern and biology of *T. canis* in which he found a definite age-sex-migration complex. He confirmed that intra-uterine infection occurs as a result of the reactivation of larvae in the somatic tissues of the bitch during pregnancy.

This study indicates the complexity of the relationship that may exist between a parasite and its host and the importance of the life history and biological facts in determining the epidemiology.—R. V. L. WALKER.

DONE, J. & GIBSON, T. E. (1958). Experimental visceral larva migrans in the pig.—*Trans. R. Soc. trop. Med. Hyg.* **52**, 302-303. [Authors' abst. modified.] 458

Visceral larva migrans was produced experimentally in pigs by administration of embryonated eggs of *Toxocara canis*. Observations were made on a series of pigs killed 8 days after receiving doses of  $10^4$ ,  $10^{4.7}$ ,  $10^{5.4}$  and  $10^{6.1}$  embryonated eggs, and also on a series of pigs killed 2, 4, 8, 16, 32, and 64 days after receiving a dose of 250,000 embryonated eggs. Parasitological examination showed the larvae had migrated to all parts of the body, and histological studies showed them to be usually associated with granulomatous lesions. Macroscopic lesions were present in the liver, lung, kidney and heart.

The clinical signs in infected pigs were stunted growth, and nervous disease characterized by ataxia and posterior paresis beginning 3 weeks after infection—associated with a high incidence of granulomatous lesions in the posterior lobe of the cerebellar vermis.

KARTAVTSEV, G. I. (1958). [Use of aviation spirit in ascaridiosis of fowls.] — *Veterinariya, Moscow* **35**, No. 5. pp. 80-81. [In Russian.] 459

A dose of 1-2 ml. of aviation spirit was administered to 3,983 chicks  $2\frac{1}{2}$  months of age and a dose of 3-4 ml. was given to 1,046 fowls. Within 2-3 hours the birds began to eliminate *Ascaridia*. No *Ascaridia* ova were detected in the faeces of 50 birds 2 weeks later, and at P.M. examination none of the parasites was found.

—M.G.G.

VOROB'EV, A. N. (1958). [Sodium fluoride in ascaridiosis of fowls.] — *Veterinariya, Moscow* **35**, No. 5. pp. 82-83. [In Russian.] 460

Forty fowls, 11-12 months old, and infested with *Ascaridia*, were given 0.2, 0.4, 0.6, or 0.8 g. of sodium fluoride in the food. The most efficient non-toxic dose was 0.6 g. mixed with 15 g. of food, which eliminated 93% of *Ascaridia*. A dose of 1.3 g./kg. body wt. was lethal. Three doses of 0.3 g./kg. body wt. eliminated 81% of *Ascaridia* from 5-month-old birds.—M.G.G.

WETZEL, R., KERSTEN, W. & EDER, H. (1958). Prophylaktische Wirkung von Piperazinhydrochlorid und Vitamin-A-Stoffwechsel beim

Spulwurmbefall (*Ascaridia galli*) der Küken. [Prophylactic effect of piperazine hydrochloride and vitamin A metabolism in *Ascaridia galli* infection in chicks.]-Zbl. VetMed. 5, 357-366. [Summaries in English, French and Spanish.] 461

Chicks were infected at the age of 3 weeks with *Ascaridia galli* and then fed *ad libitum* for the next 4 weeks on a ration containing 0.1%, 0.2%, or 0.3% piperazine hydrochloride. P.M. examination revealed a few *A. galli* in the chicks given 0.1% of the anthelmintic, but none in those given 0.2% and 0.3%. *A. galli* infection lowered the vitamin A content of the liver; piperazine hydrochloride, on the other hand, raised it. A concentration of 875 i.u. of vitamin A per g. of liver was found in uninfected chicks fed 0.1% of the drug for 4 weeks. The drug had no adverse effects on growth and health.

—M.G.G.

SHOHO, C. & KULASEGARAM, P. (1957). Kumri of horses in India. Pathological report of a case.—Ceylon vet. J. 5, 76-80. 462

Pathological findings in the brain and spinal cord of a horse which had "Kumri" in India were similar to those found in horses in Ceylon [V.B. 26, 166].—R.M.

YEH LIANG-SHENG. (1958). The microfilaria of *Setaria equina*, the genotype of *Setaria*.—Trans. R. Soc. trop. Med. Hyg. 52, 297-298. [Author's abst. modified.] 463

A blood film to show the morphology of the microfilaria of *Setaria equina*, the genotype of *Setaria*, was demonstrated. The genus *Setaria* has sheathed microfilariae which circulate in the peripheral blood. There are a few instances in the old literature in which the embryos are incorrectly described as oval eggs (e.g. von Linstow, 1897). Later literature, however, correctly described the embryos as microfilariae (e.g. Thwaite, 1927), but with one noticeable exception in which recently Sandosham (1954) described oval eggs for *Setaria* species. Therefore his determination is questionable.

YEH LIANG-SHENG. (1958). On the identity of the filarial worms *Setaria hornbyi* Boulenger, 1921, and *Setaria thwaitei* Mönnig, 1933.—Trans. R. Soc. trop. Med. Hyg. 52, 297. [Author's abst.] 464

A series of specimens were demonstrated to show that *Setaria hornbyi*, as identified in recent literature, is not conspecific with *Setaria hornbyi* as described originally by Boulenger (1921). *S. hornbyi* is essentially a parasite of *Hippotragus* species, an antelope. It has been incorrectly reported from sheep and a large number of ante-

lopes in various parts of Africa. A detailed study of the literature and of an extensive collection of *Setaria* spp. from African antelopes shows that in not more than once or twice in the literature, was *S. hornbyi* correctly identified.

This situation is partly due to Thwaite (1927) who reviewed the genus *Setaria*, and re-described *S. hornbyi* Boulenger 1921. His work became the standard reference on the subject. Unfortunately his "*Setaria hornbyi*" was a heterogeneous collection of several *Setaria* species, and not *S. hornbyi* as described by the original author, Boulenger. Mönnig (1933) further confused the situation, when he described the true *S. hornbyi* as *Setaria thwaitei* sp. nov., his only reference cited being Thwaite (1927). Since then the true *S. hornbyi* was called *S. thwaitei* and the so-called *S. hornbyi* in the literature remained a heterogeneous collection of *Setaria* spp. The species most commonly called *S. hornbyi* in the literature is *S. bicoronata* von Linstow.

*Setaria hornbyi* Boulenger, 1921, is a very large species, and from its peribuccal ring alone, it is possible to differentiate it from all the other known species of *Setaria*.

SHOHO, C. & KULASEGARAM, P. (1957). Studies on cerebrospinal nematodiasis. I. Pathological studies of goats in Ceylon affected with cerebrospinal nematodiasis.—Ceylon vet. J. 5, 81-84. 465

Although the clinical and pathological features of invasion of the central nervous system of sheep and goats by nematodes are well known, recovery of the causal parasite has seldom been achieved. The authors killed a goat 4 days after the first occurrence of nervous symptoms and found a nematode in the brain. Although the head of the worm was missing, it was identified as *Setaria digitata*.—R.M.

BACIGALUPO, J., DA GRAÑA, A. & DOLCETTI, M. (1957). Sintomatología y biología de la filariasis de los perros de Buenos Aires. [Dirofilaria in dogs in Buenos Aires.]-Rev. Fac. Agron. B. Aires 14, 3-21. 466

Filariasis in 41 dogs was characterized by symmetrical enlargement of prescapular lymph nodes, follicular conjunctivitis, ulcers or eczematous lesions of the skin, circulatory disorders and emaciation. The causal parasite was identified as *Dirofilaria acutuscula* [*D. repens*]. Its development in the intermediate hosts, *Taenio-rhynchus titillans*, *Aedes albifasciatus* and *Psorophora cyaneus* was studied.—R.M.

BORCHERT, A. (1958). Über Erkennung, Bekämpfung und Vorbeuge der Magenfaden-



wurm-, Lungenwurm- und Leberegelkrankheit der Wiederkäuer. [Diagnosis, control and prevention of stomach worm, lungworm and liver fluke infestation in ruminants.] — *Mh. VetMed.* **13**, 10-16. 467

Methods of separating the ova and larvae of helminths from faeces are described, and the differences in the size and shape of the more important forms are summarized. Hygienic measures and herd management based on knowledge of the life cycles of the parasites are described.—M.G.G.

PAVLOV, P., TATAROV, B., LAZAROV, E. & STOEV, P. (1958). Untersuchungen über die Lebensfähigkeit von Eiern und Larven parasitischer Nematoden im Silagefutter. I.

Mitteilung. [Viability of eggs and larvae of parasitic nematodes in silage. I.] — *Dtsch. tierärztl. Wschr.* **65**, 239-240. [Summary in English.] 468

Non-embryonated ova of *Ascaris lumbricoides* and *A. equorum* remained viable for over 6 months in silage, but no development took place unless they were moved to a more favourable environment. Embryonated ova were viable for 2 months and a few of the embryonated *A. lumbricoides* ova were infective for mice after 3 months, but not after 5 months. Third-stage larvae of *Dictyocaulus filaria* were not motile after 20-30 days. It is concluded that silage which has been stored for 3 months will not infect domestic animals with these parasites.

—M.G.G.

### SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

STÜNZI, H. & ENGELI, P. (1958). Zur pathologischen Anatomie der perluchtähnlichen Geschwülste des Brust- und Bauchfelles des Rindes. [Pathological anatomy of tuberculosis-like tumours of the pleura and peritoneum of cattle.] — *Schweiz. Arch. Tierheilk.* **100**, 15-22. [Summaries in English, French and Italian.] 469

Widespread pearl-like formations on the peritoneum and sometimes also on the pleura of 17 cattle were found to be true neoplasms, although superficially they closely resembled tuberculous lesions. Three cases were primary mesothelioma and the remaining 14 were metastases of carcinoma of various organs, particularly lungs and bile duct.—R.M.

DE KOCK, G. (1958). The transformation of the lining of the pulmonary alveoli with special reference to adenomatosis in the lungs (jagziekte) of sheep.—*Amer. J. vet. Res.* **19**, 261-269. 470

Breeding experiments performed at Onderstepoort revealed that the progeny of rams and ewes affected with adenomatosis inherited a susceptibility to the disease. The histology of the condition was discussed. Lesions were classified as papilliform cyst-adenoma derived from epithelium of the walls of alveoli and of bronchioles. Prolonged treatment of sheep with carcinogenic hydrocarbons introduced into their lungs, failed to set up adenomatosis, although neoplasms provisionally classified as endothelioma did occur in two sheep thus treated. Changes caused by introducing irritants into the lungs differed from those occurring in adenomatosis.—R.M.

STÜNZI, H. & RUSTERHOLZ, P. (1958). Zur Klinik und pathologischen Anatomie des Tonsillenkarzinoms beim Hund. [Clinical and pathological features of carcinoma of the tonsils in the dog.] — *Schweiz. Arch. Tierheilk.* **100**, 271-277. [Summaries in English, French and Italian.] 471

Tonsillar carcinoma was found in 5 of 727 dogs submitted for post-mortem examination, and an additional specimen was received after surgical removal from a dog. This neoplasm in dogs seemed to be much rarer in Switzerland than in England [see *V.B.* **24**, 3568].—R.M.

PURSELL, R. T. (1957). Treatment of cancer in dogs by intravenous methylene blue. — *Nature, Lond.* **180**, 1300. 472

Dogs with neoplasms, brought to the author's small-animal clinic in New South Wales, were given 2-10 ml. of a 2% soln. methylene blue intravenously. Injections were repeated on alternate days or at weekly intervals. It was stated that treatment gave encouraging results in rapidly-growing sarcomas, although it had no effect on slowly-growing neoplasms or carcinomas.—R.M.

STÜNZI, H. (1958). Zur Pathologie des Lungenkarzinoms der Katze. [Pathology of carcinoma of the lung in cats.] — *Zbl. VetMed.* **5**, 663-674. [Summaries in English, French and Spanish. English summary modified.] 473

S. described papilliform columnar-cell adenocarcinoma of the lung in 4 aged cats killed because of chronic respiratory disorders. In general the tumours were nodular growths at the periphery of the lung (extra-hilar) and one case

was probably multicentric in origin. Metastases were seen in only a single case in a bronchial lymph node. A small number of metastases was not regarded as a sign of low malignancy, but rather of relatively early euthanasia.

These tumours were derived from the surface epithelium of the bronchi, or in one case possibly from the bronchial lymph nodes. No increase in lung tumours has been observed in either dogs or cats. This is understandable when one remembers that it is the small cell anaplastic lung cancer (rare in animals) which has increased in man, whereas adenocarcinoma of the human lung of the type seen in carnivora shows no significant increase in incidence.

PALLASKE, G. (1958). Pathologische Anatomie der Säugetierleukosen. [**Pathology of leucosis in mammals.**] — *Mh. VetMed.* **13**, 65-72. **474**

The pathology of leucosis in cattle, pigs, dogs and cats, horses, sheep and goats, and rodents is reviewed, and a comparison is made with the human forms of the disease.—M.G.G.

WINQVIST, G. (1958). Die Hämatologie der Tierleukosen. [**Haematology in animal leu-**

**cosis.**] — *Mh. VetMed.* **13**, 161-164. **475**

The haematology of leucosis in domestic mammals, particularly cattle, is reviewed. Diagnosis of the disease by lymphocyte count alone is considered unreliable. The possibility of diagnosis by both the number of lymphocytes and their morphology is discussed. Nine photographs of abnormal lymph cells from leucaemic cattle are presented.—M.G.G.

GROTH, W. (1958). Schilddrüsen- und Nebennierenbefunde bei der Hühnerleukose. [**The thyroid and adrenal glands in avian leucosis.**] — *Mh. VetMed.* **13**, 142-146. **476**

The thyroid and adrenal glands were examined in 45 fowls with the lymphatic type of leucosis. The thyroid gland weighed less than in healthy birds of the same age, but the same as in birds with malnutrition. It was inactive in 28 of 33 birds. In 12 of 32 birds mild leucotic infiltration of the thyroid was seen. Leucotic changes of the adrenal glands, usually extensive, were found in 25 of 40 birds. In 37 of 40 birds the interrenal tissue showed hypertrophy and/or hyperplasia and a high lipid content. Paralysis in 2 birds was ascribed to destruction of the adrenal glands by leucosis.—M.G.G.

## NUTRITIONAL AND METABOLIC DISORDERS

NORRIS, L. C. (1958). **The significant advances of the past fifty years in poultry nutrition.** — *Poult. Sci.* **37**, 256-274. **477**

This review begins with a general account of early work on the nutritional requirements of the chick. Histories are given of the early work on vitamins A, B, B<sub>12</sub>, D, E and K followed by sections on manganese, chlorine and niacin deficiencies. The value of feeding antibiotics and their possible modes of action are considered. An account is given of some of the work on the energy requirements of poultry and the relationship between the protein requirements and energy content of the ration; the value of high energy rations is indicated. Finally, the author describes how heat treatment of soyabean oil meal improved its feeding value.

—E. J. CASTLE.

I. SERGIENKO, A. I. & SPIVAKOV, A. S. (1958). [**Use of insulin in ruminal atony and fodder intoxication in cattle.**] — *Veterinariya, Moscow* **35**, No. 9 p. 78. **478**

II. GZITSKII, S. Z. & OTHERS. (1958). [**Insulin for diseases of the digestive tract of cattle.**] — *Ibid.* pp. 78-79. **479**

I & II. Insulin was administered s/c in doses of 100-200 units, sometimes in conjunc-

tion with 300-500 ml. 35% glucose soln. i/v. If there was no response to the first dose, treatment was repeated two or three times at intervals of 6 or 8 hours. From the results of 378 cases it was claimed that the treatment was rapidly effective in ruminal atony.—R.M.

SCHUMACHER, E. (1958). Zur Frage der Bekämpfung des Schaumzustandes im Panseninhalt des Rindes durch Silikon. II. Mitteilung: Schaumzerstörungs- und Gärversuche an Pansensaft. [**Control of foamy rumen contents with silicone. II. Foam destruction and fermentation tests on rumen juice.**] — *Schweiz. Arch. Tierheilk.* **100**, 98-103. [Summaries in English, French and Italian.] **480**

Model experiments on foamy rumen contents of healthy cows were carried out by stirring 45 ml. centrifuged rumen juice for 2 min. The foam of a first quantity was used as a control, that of a second was used in the foam destruction test with silicon; one drop of silicon is placed after 2 min. on top of the froth. Thus comparative values of natural foam-breakdown and of the destructive power of silicon are obtained. In practice the results are modified on account of the bubbles being more or less wide



apart [see *V.B.* 28, 3308]. The results indicate that the rate of foam destruction is reduced as the breakdown of the foam progresses, each drop of liquid developing by the breakdown of a bubble retaining a certain amount of silicon. There is, thus, a relation between the quantity of silicon and the volume of the lamella of the bubbles to be destroyed. If the amount of silicon is too small in ratio to this volume, the breakdown of the foam is arrested prematurely. Fermentation tests showed that silicon inhibition by gaseous fermentation is insignificant.

—E. S. FOUNTAIN.

DOIZAKI, W. M., LIENER, I. E., STOWE, C. M. & STEVENS, C. E. (1958). **Apparent activation of bovine erythrocyte acetylcholinesterase by saponin.**—*Arch. Biochem.* 73, 425-434. 481

Intravenous administration of saponin to cows increased the acetylcholinesterase activity of erythrocytes in blood; tympanites developed in 3 of 8 cows thus treated. Addition of saponin to samples of haemolysed erythrocytes also increased activity of the enzyme. The apparent activation of enzyme by saponin was caused by release of the enzyme from the cell stroma; the true action of saponin and four other surface-active agents tested was to inhibit the enzyme.

—R.M.

STÖBER, M. & TIEFENBACH, B. (1958). Pansen-saftgewinnung und Vormagenentleerung zu therapeutischen Zwecken — Prüfung der Brauchbarkeit von drei Instrumenten. [Methods of obtaining rumen juice and of emptying the forestomachs for therapeutic purposes: a trial of three instruments.]—*Dtsch. tierärztl. Wschr.* 65, 11-16. 482

After summarizing the literature on methods of removing solid matter and fluid from the forestomachs of cattle, the authors described trials with the instrument for obtaining rumen juice described by Sørensen & Schambye (1955), the stomach tube of Madsen used for bloat [see *V.B.* 26, 3553], and a soft rubber stomach tube with an inside diameter of 10 mm. inserted through the nostril. The first was particularly suitable and the last was not suitable for obtaining therapeutic quantities of rumen juice (at least 2 litres within 10 min.). The instrument of Sørensen & Schambye was unsuitable, however, for emptying the forestomachs of food in acute indigestion; in such cases rumenotomy was carried out.—M.G.G.

BROBERG, G. (1958). Undersökningar om faktorer, som påverka pH-värdet och det osmotiska trycket i våmmen vid akuta förändringar med kolhydratrikt foder hos får.

[Factors influencing pH and osmotic pressure in the rumen of sheep during acute overeating of carbohydrate-rich food.] — *Finsk. Vet-Tidskr.* 64, No. 9 450-464. [In Swedish. Summary in English.] 483

Liberal administration of carbohydrates leads to pronounced acidity of the rumen contents, due to formation of large amounts of lactic acid. As a rule the conc. of fatty acids is simultaneously depressed. The authors studied the relationship between salts and free acids, and determined the osmotic pressure in the rumen. This normally lay between 6 and 9 moles, but excessive carbohydrate increased it to 20 or 25 moles. The response of sheep to excess carbohydrate varied: some died on the second or third day and others showed only anorexia, despite high content of lactic acid and low pH in the rumen. Factors which influence the degree of illness are being studied.—R.M.

HERZBERGER, A. C. (1958). **Lipodystrophy in a black leopard.** — *J. Amer. vet. med. Ass.* 133, 221-222. 484

H. describes an unusual case of chylous ascites of the pleural and peritoneal cavities in a black leopard. There were no tumours, granulomatous infections or signs of trauma to account for this condition. He concluded that this was a case of intestinal lipodystrophy similar to Whipple's disease in man.—R. N. FIENNES.

LEFROU, G. & MICHARD, V. (1958). Étude clinique et histologique sur la stéatose hépatique des chimpanzés morts en captivité à l'Institut Pasteur de Kindia. [Clinical and histological study of hepatic steatosis in captive chimpanzees at Kindia, French Guinea.] — *Ann. Inst. Pasteur* 95, 314-325. [English summary modified.] 485

Hepatic steatosis in chimpanzees was similar in some ways to that in kwashiorkor in African children. Chimpanzees seem to be suitable for the study of steatosis.

DALGAARD-MIKKELSEN, S., MOMBERG-JØRGENSEN, H. C. & PETERSEN, F. H. (1958). Forebyggelse af "gult fedt" hos mink. [Control of "yellow fat" disease in mink.] — *Beretr. Forsøgslab. Kbh.* No. 308. pp. 31. [In Danish.] 486

The development of "yellow fat" disease in mink is primarily due to the fish oil content of the diet. In feeding tests in which lean fish (cod or fish offal) was replaced by mackerel and cod-liver oil, 10% of fish oil caused the disease with considerable mortality; about 6% of fish oil also caused the condition fairly severely; with

5%, typical fat tissue changes were found but without mortality. The addition of 50–100 mg. methylene blue per kg. fodder had the same protective effect as about 50 mg.  $\alpha$ -tocopherol acetate, decreasing mortality and reducing peroxidation in the fatty tissues. The best way to prevent the condition in kits is to regulate the composition of the dietary fat so that the fish oil does not exceed 3–4%. A fodder containing 30% mackerel together with lean fish is considered to be safe. 3–4% pork fat or beef tallow can safely be added to a diet of lean fish or fish offal. The degree of rancidity of the oil possibly plays a role and there may be differences in the effect of oil from different species of fish.—F.E.W.

SCHMIDT-NIELSEN, B., OSAKI, H., MURDAUGH, H. V. & O'DELL, R. (1958). **Renal regulation of urea excretion in sheep.**—*Amer. J. Physiol.* **194**, 221–228. 487

Urea clearance and glomerular filtration rate were studied in sheep during normal and low protein intake and under varying conditions of urine excretion.—R.M.

JUNGHERR, E. L., SNYDER, J. M. & SCOTT, H. M. (1958). **Cytopathologic changes in liver cord cells of arginine-deficient chicks.**—*J. Nutr.* **65**, 281–292. [Authors' summary modified.] 488

The liver cord cells of chicks fed a purified diet of 22% casein and poor in magnesium and arginine showed cytopathological changes characterized by a large intranuclear central basophilic body accompanied by hydrodystrophic changes of the nucleoplasm and the cytoplasm. Histochemical tests suggested that the large body consisted primarily of ribonucleic acid and represented a hypertrophied nucleolus. The hepatic lesion was corrected by arginine. There were no consistent lesions in the cerebellar Purkinje cells referable to either arginine deficiency or the lowest concentration of magnesium fed. Supplementation with magnesium accentuated the hydrodystrophic alteration of the liver cord cells, but failed to correct the nucleolar hypertrophy. The latter lesion has been observed previously in rats fed toxic doses of thioacetamide or acetamide, but not in nutritional deficiencies.

DURAND, M. & KCHOUK, M. (1958). Le "Krafft" une osteopathie dystrophique du dromadaire. [**"Krafft" an osteodystrophic disease of camels.**]—*Arch. Inst. Pasteur Tunis* **35**, 107–152. 489

The authors investigated an osteodystrophic condition common in camels kept on certain pastures in southern Tunisia. Those interested in

these diseases should consult this important work in the original. Clinically the condition is characterized by fractures, stiffness and difficulty in walking, lying down and rising, with consequent inability to feed, resulting in death. During life, bony nodules are frequently found on the ribs. P.M. examination reveals soft bony swellings either on the internal or external surface of the ribs.

There is excessive fragility of the bone due to osteoporosis with narrowing of the bony shafts and intense fibrous reactions of the periosteum. Radiological examination reveals a diffuse and general rarefaction of the long and flat bones, and transverse bands on the ribs simulating the 'Zones of Looser' in human osteomalacia, and radiologically reminiscent of Milkman's syndrome.

Blood analysis shows hypercalcaemia and hyperphosphataemia associated with elevated alkaline phosphatase and excessive calcium in the urine.

The disease is attributed to a mineral imbalance in the pastures, i.e., a relative aphosphorosis and an absolute excess of calcium, reflecting a similar imbalance in the mineral salts of the soil.

Treatment and prophylaxis will consist in pasture rotation and, on pastures which have been incriminated, restricting ingestion of the native plants by providing a sufficient proportion of healthy fodder, such as barley, from other parts.—R. N. FIENNES.

GREAVES, J. P., SCOTT, P. P. & SCOTT, M. G. (1958). **Raw meat and carnivores: the effects of feeding ox heart to kittens.**—*Proc. Nutr. Soc.* **17**, No. 2. pp. xlvii–xlvi of Abstracts. 490

Kittens of 10–14 weeks of age fed exclusively on a diet of ox heart developed incoordinated gait, weakness of hind limbs and sensitivity to handling after 6 weeks. X-rays showed rarefaction of the skeleton, especially vertebral column, pelvis and scapulae, and spontaneous fractures occurred in some instances. The general condition was good even after the onset of partial paralysis. Histologically the bone changes resembled those of osteomalacia, the thyroids were hyperaemic with little colloid, and some epithelial sloughing occurred in the small intestine.

Ox heart is low in calcium (8 mg./100g. wet wt.) with a Ca/P ratio of 1:20, and in experiments still in progress in which ox heart is being supplemented with calcium gluconate, vitamins A and D and iodine, the Ca supplemented group showed no symptoms after 12



weeks. A similar condition is described in the literature affecting animals on a purely flesh diet, and it can occur in zoo lions.

—A. B. PATERSON.

MEYER, H. & RUSTIGE, J. (1958). Über den Einfluss des Ammoniakgehaltes im Pansen auf die Höhe des Kalzium- und Magnesiumspiegels im Blut des Rindes. [**Influence of the ammonia content of the rumen on the calcium and magnesium content of the blood of cattle.**] — *Dtsch. tierärztl. Wschr.* **65**, 131-135. 491

The ammonia content of the rumen in cattle rose for 2-3 hours after feeding and then fell again slowly. Blood samples from 8 cows before feeding and 2, 4, 7 and 10 hours after showed a slight fall in calcium and magnesium content 2-4 hours after feeding. Small doses of urea, given after fasting, caused similar slight changes in blood composition, but toxic doses of urea did not enhance this effect. It is concluded that high concentrations of ammonia in the rumen are not the cause of hypomagnesaemia in grass tetany.—M.G.G.

MERSHON, M. M. & CUSTER, F. D. (1958). **Tetany in cattle on winter rations. Part 1—A clinical report.**—*J. Amer. vet. med. Ass.* **132**, 396-400. 492

In certain areas of West Maryland and West Virginia hypomagnesaemic tetany was seen in beef cattle grazing winter pasture, and the condition usually disappeared when pasture growth recommenced. Symptoms are described and the treatment and prognosis discussed. The case histories and serum calcium and magnesium levels are given for 20 animals. In nearly all cases there was hypocalcaemia as well as hypomagnesaemia.

—E. J. CASTLE.

CASSIDY, J. & EVA, J. K. (1958). **The variation in the concentrations of copper and iron within and between the lobes of pig's liver.**—*Proc. Nutr. Soc.* **17**, No. 2 pp. xxx-xxxi of Abstracts. 493

Livers from 3 bacon weight pigs and one pork pig were sampled. Samples of about 40 g. were taken for analysis from each of the four lobes: about 30 samples from each liver. The results indicated considerable variations in the concentration of both copper and iron in the samples from any one animal, sufficient, it was considered, to invalidate analyses from a single liver biopsy.—JOYCE E. HAMMANT.

CASSIDY, J. & EVA, J. K. (1958). **Relationship between the copper and iron concentration in**

**pigs' livers.**—*Proc. Nutr. Soc.* **17**, No. 2. p. xxxi of Abstracts. 494

In pigs kept on a diet containing copper 125 p.p.m. (7 pigs), 250 p.p.m. (6 pigs) and 500 p.p.m. (7 pigs), and which contained a constant amount of iron of 400 p.p.m., there was an inverse relationship between the amounts of copper and iron stored in the liver. Several samples were taken from each of the 4 lobes of the liver and pooled to ensure that analytical results represented the values obtainable from the whole. As the concentration of copper increased through the mean values 39, 154, and 558 p.p.m., corresponding to the increased copper intake from the diet, the iron content decreased through the mean values 118, 92 and 36 p.p.m. despite the equal intake of iron in all groups. Copper thus exerted a depressing effect on storage of liver iron.

—A. B. PATERSON.

MORRISON, A. B. & SARETT, H. P. (1958). **Studies on zinc deficiency in the chick.**—*J. Nutr.* **65**, 267-280. [Authors' summary modified.] 495

Chicks fed a semi-purified diet containing soya-bean protein from 12 to 26 days of age grew faster when zinc was added to the diet. However, added zinc had no effect on growth when casein and gelatin were the sources of protein. Both diets contained about 30 p.p.m. of zinc, 4.8 p.p.m. of which was supplied in the mineral mixture. Chicks which received the soya-bean protein diet with zinc omitted from the mineral mixture showed retarded growth, lowered efficiency of food utilization and shortened and thickened tibio-tarsi. Omission of zinc from the mineral mixture in the casein-gelatin diet depressed growth also, but to a lesser extent. Zinc deficiency had no apparent effect on the percentage of ash in the tibio-tarsi or on liver and carcass composition. The addition of excess calcium to the soya-bean protein diet depressed weight gain and efficiency of food utilization. Additional zinc, however, counteracted these effects, suggesting that excess calcium may increase the dietary requirement for zinc.

HASS, G. M., TRUEHART, R. E., TAYLOR, C. B. & STUMPE, M. (1958). **An experimental histologic study of hypervitaminosis D.**—*Amer. J. Path.* **34**, 395-431. 496

Irradiated ergosterol was injected i/m into rabbits between 2 and 7 times a week for 6-8 weeks. Generalized calcinosis was produced by a total dose of 300,000 U.S.P. units or more.

Histological changes in each of the body systems are described, and there are 5 plates of photomicrographs.—R.M.

KUBIN, G. (1958). Über die enzootische Herz- und Skelettmuskeldegeneration der Lämmer. [**Enzootic cardiac and muscular degeneration in lambs (stiff lamb disease).**] — *Wien. tierärztl. Mschr.* **45**, 293-302. [Summaries in English, French and Italian.] **497**

Using the literature and his own observations in Egypt, K. described the clinical symptoms, P.M. lesions, and prophylaxis of muscular dystrophy in lambs. He also discussed muscular dystrophy in calves, disorders due to vitamin E deficiency in pigs, the role of vitamin E in the body, and an affection which he has observed in calves in Austria, characterized by loss of hair, weakness, emaciation, and heart muscle dystrophic lesions resembling those of vitamin E deficiency.—M.G.G.

GIROUD, A., LEFEBVRES-BOISSELOT, J. & DUPUIS, R. (1957). Un régime polyvitaminé est-il moins tératogène qu'un régime dépourvu d'une seule vitamine B? [**Teratological effect of deficiency of one or other of the vitamin B complex.**]—*C. R. Soc. Biol., Paris* **151**, 2085-2087. **498**

More abnormal foetuses were found in rats fed a diet deficient in pantothenic acid than in rats on a diet deficient in all vitamins of the B complex.—R.M.

KOENIG, H. (1958). **Production of injury to feline central nervous system with nucleic acid antimetabolic.** — *Science* **127**, 1238-1239. **499**

A nucleic acid antimetabolite, 5-fluorotic acid, was injected intracisternally into anaesthetized cats. It caused degeneration of Purkinje cells in the cerebellum, damage to neurones in the brain stem and spinal cord, and impairment of protein metabolism in nerve and glial cells. These findings indicated that some degenerative and other pathological processes in the central nervous system may be caused by biochemical or other disturbances in nucleic acid metabolism.—R.M.

BURROUGHS, W., RAUN, A. & CHENG, E. (1958). **Effects of methimazole on thyroid and live weights of cattle.**—*Science* **128**, 147. **500**

Methimazole is a synthetic goitrogen also known as 1-methyl-2-mercaptoimidazole or "Tapazole." After a concentration of 0.007% in the food (equivalent to 800 mg./animal daily) had been fed for 79 days to steers weighing about 975 lb. the thyroid glands were four times

the size of untreated controls. Unlike thiouracil, the drug did not depress appetite. Overall utilization of feed was increased by 13%. Treatment did not appear to affect meat quality.—R.M.

REID, R. L. (1958). **Pregnancy toxæmia in ewes.**—*Agric. Rev., Lond.* **4**, 20-25. **501**

From work done at the Sheep Biology Laboratory in New South Wales, it was suggested that the metabolism of the ewe with pregnancy toxæmia was analogous to diabetes induced by adrenal steroids. High amounts of hydrocortisone in plasma from affected ewes probably resulted from adrenal activation caused by transport or other change in environment. When this state was combined with interference in glucose utilization caused by hypoglycaemia due to undernutrition, toxæmia resulted. It was noted that only early cases of toxæmia induced in well-nourished ewes responded to oral administration of 4 oz. glycerol: ewes which had been undernourished for some time did not respond to this therapy.—R.M.

HOLM, L. W. (1958). **Studies on the treatment of ovine pregnancy toxæmia with corticosteroids and ACTH.**—*Cornell Vet.* **48**, 348-357. [Author's summary modified.] **502**

When cortisone and hydrocortisone were given to ewes with pregnancy toxæmia, blood glucose, blood ketones, and the degree of acidosis did not differ from those of untreated animals from the same outbreaks and in comparable stages of the disease. The survival rate of all treated groups was uniformly low and did not differ from that in the untreated group.

Evidence obtained from six animals treated with large doses of ACTH seemed to indicate that the hormone hastened parturition, even though survival of the ACTH-treated animals was as low as that of other groups.

BOUCKAERT, J. H., OYAERT, W. & SEGERS, J. (1958). **Acetate tolerance test in normal and ketonaemic cows.**—*Zbl. VetMed.* **5**, 101-108. [In English. Summaries in French, German and Spanish.] **503**

Two groups of cows, one normal and one ketonaemic, were given sodium acetate intravenously and blood samples taken at intervals during the succeeding hour. An immediate rise in blood ketones followed the injection, in all cows, but no difference was observed between the two groups.

The rate at which acetate disappeared from the blood after injection was fastest in normal cows which had been starved for 24 hours and slowest in the ketonaemic animals. Treatment of



the ketonaemic cows with glucose, glucose plus insulin, or sterane increased the rate of removal of the acetate compared to that of the normal animals.—E. J. CASTLE.

SAKAMOTO, T., SONODA, M. & NAKAMURA, R. (1958). **Clinical and biochemical studies on the basis of ketone bodies in cattle. IV. Observations in cattle affected with various diseases.**—*Jap. J. vet. Res.* 6, 35-47. [In English.] 504

A study of the level of blood and urinary ketones, blood sugar, and blood level of eosinophile leucocytes in 171 cases of miscellaneous diseases in cattle including digestive, respiratory, urinary and metabolic disorders and infertility, suggested that these estimations are indispensable in differential diagnosis of ketosis and other disorders. A tendency to eosinophilia existed in all cases of ketosis, but ketonaemia frequently occurred in other diseases with the exception of the infertilities and mercury poisoning.

—A. B. PATERSON.

MAYES, P. A. (1958). **Level of liver glycogen in ketosis.**—*Nature, Lond.* 182, 324-325. 505

Female rats fasted for 24 hours to reduce liver glycogen were maintained on a diet of filtered butter-fat and salts for 7 days, when they were killed and the fat and glycogen content of the liver determined. Ketonaemia increased rapidly to the third day, then maintained a high level, whereas ketonuria reached a maximum then diminished, suggesting an alteration of renal threshold. Liver fat was elevated, but appreciable quantities of liver glycogen were also found and co-existed with high ketonaemia. A low level of total urinary nitrogen excluded the possibility that the liver glycogen was formed by gluconeogenesis from protein. While ketosis undoubtedly occurs when the liver glycogen is low, the experiment proves that a significant concentration of glycogen in the liver does not

indicate that ketonaemia cannot occur. The results suggest the operation of a non-glycogenolytic ketogenic factor, possibly of pituitary origin, the effects of which are superimposed on the inverse relationship between liver glycogen level and degree of ketosis.—A. B. PATERSON.

WORDEN, A. N. & REID, T. F. (1958). **Soluble lactates and their probable value in ruminant ketosis.**—*Vet. Rec.* 70, 520-521. 506

Significant increases in blood lactic acid and glucose were obtained by dosing fasted yearling female goats with sodium and calcium sodium lactate, but not with calcium lactate. Dosage rates were equivalent to 1 to 3 g. lactic acid per kg. body wt. Goats given prednisolone as well as calcium sodium lactate suffered no adverse effects. It is considered that calcium sodium lactate is likely to prove useful in the treatment of ketosis.—E. J. CASTLE.

BROWN-GRANT, K. & GALTON, V. A. (1958). **Iodinated compounds in milk after radioiodide administration.**—*Biochim. biophys. Acta* 27, 422-423. 507

Brown-Grant has previously described the appearance of inorganic iodide and protein-bound iodine in the milk of lab. animals following administration of radioiodide [*J. Physiol.* 135, 644 (1957)]. Further study of the protein-bound iodine revealed that on enzymic hydrolysis it yielded monoiodotyrosine and at least two other components not identified. Contrary to expectations, diiodotyrosine was scarce or absent.—R.M.

KULP, J. L. & SLAKTER, R. (1958). **Current strontium-90 level in diet in United States.**—*Science* 128, 85-86. 508

Vegetables, cereals and milk contained on the average 9.4, 13.5 and 6.1 strontium units respectively, in 1956/57. [1 unit = 1  $\mu\mu\text{C}$  of radiostrontium per g. of calcium.] Data for individual foods are listed.—R.M.

## DISEASES, GENERAL

AUDY, J. R. (1958). **The localization of disease with special reference to the zoonoses.**—*Trans. R. Soc. trop. Med. Hyg.* 52, 308-328. Discussion: pp. 329-334. [Author's summary.] 509

Each population of each animal species supports an assemblage of parasites which has a pattern characteristic of the population; this is part of the parasite-pattern of the species. The disease-pattern is an expression of the larger parasite-pattern. The origin and development of these patterns are discussed in relation to the topographical localization of disease.

Current hypotheses, including Pavlovskii's "doctrine of nidality," are reviewed.

A working definition of parasites is given, based on the reversal of Elton's "pyramid" of animal numbers, and host-parasite relationships are clarified as a necessary basis for discussion of the present problem.

Attention is drawn to aspects of evolution, to diseases as occupying both habitats and niches, to domiciliation of vectors and reservoir hosts, to the relevance of migration, to host-responses in general, and to the importance of mosaic vegetation and fringe-habitats.

A useful grouping of parasites is given, into host-, nest-, and field-dwelling types.

The fundamental difference between maintaining- and incidental-hosts is stressed, the former being responsible for maintaining a parasite.

The problem of localization of human diseases is discussed in three stages: (a) localization of infections among maintaining-hosts in nature; (b) extension of parasites to new maintaining-hosts; and (c) social aspects of contact with existing parasite-systems.

Man is considered to differ significantly from animals in his type of disease-pattern.

LINDT, S. (1958). Über Krankheiten des syrischen Goldhamsters (*Mesocricetus auratus*). [**Diseases of the hamster.**] — *Schweiz. Arch. Tierheilk.* 100, 86-97. [Summaries in English, French and Italian.] 510

Statistical investigations showed that, in small-animal practice, hamsters, either from breeding establishments or kept as pets, constituted 3-4% of the patients. Trauma, gastrointestinal and skin disorders head the list of the various diseases. The main causes are mismanagement, mineral and vitamin deficiencies and excessive light.—E. S. FOUNTAIN.

FREI, A. (1958). Die Aerosolbehandlung beim Pferd. [**Aerosol therapy in respiratory diseases of horses.**]—*Schweiz. Arch. Tierheilk.* 100, 58-63. [English, French and Italian summaries.] 511

An aerosol apparatus used in human medicine was adapted for treating horses with persistent affections of the respiratory tract. A nose-piece consisting of a short aluminium tube was fitted, and a plastic tube 4 metres in length connected the aerosol apparatus with the electric motor, so that the latter could be placed at a distance from the animal. Aerosol is applied for 10-20 min. at a time, once or twice a day, over a period of 14 days. If this is unsuccessful, a further similar treatment is given after an interval of 14 days. Any suitable drugs may be used; the author often uses an expectorant with a base of eucalyptus and turpentine.—M.G.G.

GORIŠEK, J. (1958). Die Bestimmung des Prothrombingehaltes von Blutplasma und Blutserum als Leberfunktionsprüfung beim Pferd. [**Prothrombin content of blood plasma and serum as indicator of liver function in horses.**] — *Dtsch. tierärztl. Wschr.* 65, 268-271. [Summary in English.] 512

The prothrombin content of blood plasma and serum was determined in 108 horses with diseases of the liver. The content fell with in-

creasing damage to the liver, as determined by liver biopsy. It is concluded that this test has both diagnostic and prognostic value.—M.G.G.

KIELSTEIN, P. (1958). Der Einfluss des Alters auf das Differentialblutbild des Pferdes. [**Effect of age on the blood picture in horses.**] — *Berl. Münch. tierärztl. Wschr.* 71, 10-11. [English summary.] 513

The blood picture was studied in 274 horses between the ages of 4 days and over 25 years. The new-born foal has a high percentage of neutrophils (72%), 26.3% of lymphocytes, hardly any basophils, and very few eosinophils and monocytes. From 3-6 weeks of age until 5-9 months neutrophils decrease to about 39% while lymphocytes increase. At 10 months the process is reversed, so that, up to the age of 20-25 years, the older the horse, the higher the percentage of neutrophils (maximum of about 65.2%) and the lower the percentage of lymphocytes. After 25 years neutrophils decrease sharply. In stallions, however, neutrophils appear to decrease again from 1½ to 3 years of age; this was observed in 5 stallions from one stable.—M.G.G.

VARENIKA, D. (1958). Haematuria cancerogenes bovis—Mikrohaematuria. [**Microhaematuria in bovine chronic haematuria.**] — *Dtsch. tierärztl. Wschr.* 65, 378-382. [Summary in English.] 514

Occult haematuria was detected by the benzidine test, Heller's albumin test, and by sediment microscopy. Pathological investigations were carried out on the genito-urinary tract. Whereas the chemical tests were positive in the majority of the animals from regions where haematuria was known to be endemic, the morphological and histological examinations were mostly negative. In a small number of the animals in which occult haematuria had been detected the disease became clinically manifest in the second part of the summer, the peak being reached in the beginning of autumn. It is most likely that the agent producing haematuria is present in the grass of pastures at high altitudes or in woods.—E. S. FOUNTAIN.

POINTNER, S. (1958). Der "Kompressionsversuch" (modifizierte Valsalvasche Versuch) bei der Frühdiagnose einer Herztamponade beim Rind und bei der Pericarditis traumatica des Rindes. [**A modified Valsalva's test for early diagnosis of traumatic pericarditis in cattle.**]—*Wien. tierärztl. Mschr.* 45, 364-377. [Summaries in English, French and Italian.] 515



In traumatic pericarditis it is necessary to differentiate between the dry and the exudative form. The latter induces gradually increasing cyanosis, dyspnoea; the former is characterized by pericardial rubbing. The Valsalva test, consisting mainly in maximum activation of all expiratory muscles while the glottis is firmly closed [the technique in cattle is described], permits differentiation of pericardial and endocardial sounds, the respiratory sounds being suppressed. P. considers this test to be of value in early diagnosis and designates it 'compression test'.

—E. S. FOUNTAIN.

SIGURDSSON, B. & PÁLSSON, P. A. (1958). **Visna of sheep. A slow, demyelinating infection.**—*Brit. J. exp. Path.* **39**, 519-528. [Authors' summary modified.] **516**

Microscopically typical lesions were infective as early as 16 days and as late as 849 days after inoculation. The lesions seem to originate in and under the ependyma in the brain and spinal cord and to spread from there. Inflammation of the glial type is severe in the white matter of the brain and cerebellum and seems to precede demyelination in the same areas. In some cases inflammation was found around the central canal and in the grey matter of the spinal cord during a certain stage of the infection (from the 2nd to the 4th month). Meningitis was present in most cases.

The peculiarities of Visna as a slow infection and similarities to the demyelinating diseases of man are discussed. [See also *V.B.* **28**, 426.]

SCHULZE, W. & SCHÜTZLER, H. (1958). Knochenmarkuntersuchungen beim Schaf mit besonderer Berücksichtigung der Technik der Brustbeinpunktion. [Studies of the bone marrow in sheep with special reference to the technique of sternal puncture.] — *Dtsch. tierärztl. Wschr.* **65**, 150-156. **517**

The technique of obtaining bone marrow from sheep by sternal puncture is described. Samples were taken from 10 Merino and 10 Karakul sheep, and compared with peripheral blood. The ratio of granulocytes to erythroblasts excluding lymphocytes was 0.97:1, and the ratio of immature to mature granulocytes was 0.42:1. The number of mitoses per 100 cells was 0.31 in granulopoiesis and 0.55 in erythropoiesis. The use of this technique in the diagnosis and prognosis of disease is discussed.—M.G.G.

TAYLOR, T. G., MOORE, J. H. & LOOSMORE, R. M. (1958). **Some effects of bone fracture in hens.**—*Zbl. VetMed.* **5**, 579-588. [In English, Summaries in French, German and Spanish.] [Authors' summary modified.] **518**

One metatarsus of each of 4 laying and 12 non-laying hens was fractured. Medullary bone was entirely absent from the unfractured metatarsi of all birds and from the fractured metatarsi of the non-laying birds, with the exception of one which proved to be on the point of laying. In laying hens medullary bone formed a thin layer over the entire endosteal surface 10 and 15 days after the fracture, but little or none was present 5 or 7 days after fracture. Blood supply is apparently an important factor in determining whether or not a particular bone develops medullary bone, but since the amount of medullary bone induced by fracture was much less than normal, it seems that a local factor is also involved.

Compared with their unfractured homologues, the fractured metatarsi gained in weight, while the femora and tibiae on the fractured side lost weight.

In 3 hens which were allowed to live, a spur developed on the fractured shank, but the spur papilla on the unfractured shank remained undeveloped. Increased vascular supply to the fractured limbs was possibly responsible for spur development.

ROSENFELD, G. (1958). **Effects of a single lethal dose of total-body Co<sup>60</sup> gamma irradiation on calves.**—*Radiation Res.* **9**, 346-357. [Author's summary modified.] **519**

The investigation contains clinical, body-weight, temperature, mortality, haematology, and pathology data on the response of the calf to a single lethal dose of 600 r of total-body gamma irradiation from Co<sup>60</sup>. The mean survival time of 23 animals maintained until spontaneous death was 9.9 days.

The clinical syndrome was characterized by progressive weight loss, recovery from an early diarrhoea and anorexia, an essentially asymptomatic period of 4 to 5 days, the reappearance of watery diarrhoea and anorexia, followed by inflammation of the eyelids, lachrymation, a viscid nasal discharge, lassitude, and an unsteady gait. Pronounced malaise, apathy, and respiratory distress with marked salivation were usually apparent for 24 hours before death. The rectal temperature rise by the fourth day was usually prognostic of an early or delayed fatal outcome.

The early changes in the peripheral blood after exposure were spectacular. Within 12 hours the lymphocyte and eosinophile counts fell to near-minimum levels, whereas the heterophiles increased about 800%. The latter then dropped sharply to their pre-irradiation level by the

second day, and thereafter decreased consistently until the seventh day, when few were detectable. The platelet count remained within the control range for the first 5 days, after which it decreased linearly. Lowered haematocrit values were observed usually by the ninth day.

The clinical and haematological findings were readily correlated with the lesions, which

revealed the characteristic tissue changes already reported for other mammals. Evidence of infection, particularly pneumonitis, was an outstanding agonal finding. After the seventh day, the haematopoietic syndrome predominated and the pathological findings were mainly the sequelae of the severe pancytopenia resulting from bone marrow aplasia.

## POISONS AND POISONING

SCHÖBERL, A. (1958). Moderne Methoden für den Nachweis von Bleivergiftungen. [**Modern methods for the detection of lead poisoning.**]—*Dtsch. tierärztl. Wschr.* **65**, 235-239. [Summary in English.] **520**

The photometric method, using diphenylthiocarbazone, and the polarographic method are both suitable for the determination of lead in biological material. In 5 normal cattle the lead content of the blood varied between 0.03 and 0.17 mg.%. In 4 cattle grazing near a lead mine concentrations of 0.23-0.72 mg.% were found in the liver. Two deer with paralysis of the hind legs, captured near a lead mine, had liver concentrations of 0.6 and 0.7 mg.% and bone concentrations of 4.8 mg.%.—M.G.G.

NEWELL, G. W. & SCHMIDT, H. J. (1958). The effects of feeding fluorine, as sodium fluoride, to dairy cattle—A six-year study.—*Amer. J. vet. Res.* **19**, 363-376. **521**

20 Friesian cattle kept under farm conditions were given NaF in the food in daily amounts equivalent to either 1, 1.5, 2, or 2.5 g. fluorine per kg. body wt. Control cows not receiving sodium fluoride consumed between 0.15-0.33 g./kg. body wt. fluorine a day from food and water. The minimum daily dose likely to produce toxic symptoms after 6 years' continuous administration was between 2 and 2.5 g./kg. (equivalent to 60-86 p.p.m. fluorine in the food and/or water).—R.M.

SUTTIE, J. W., PHILLIPS, P. H. & MILLER, R. F. (1958). Studies of the effects of dietary sodium fluoride on dairy cows. III. Skeletal and soft tissue fluorine deposition and fluorine toxicosis.—*J. Nutr.* **65**, 293-304. [Authors' summary modified.] **522**

Dairy cows fed for 5½ years on a basal ration containing 3.5 p.p.m. of fluorine stored less than 1000 p.p.m. in the skeleton. Cows fed the basal ration supplemented with 20 or 50 p.p.m. of fluorine stored 4.5 and 10 times as much as the controls respectively. Fluorine concentration varied with the type of bone; cancellous bone contained more than compact leg

bones. Fluorine toxicosis was associated with a fluorine content of compact bone and of cancellous bone in excess of 5500 and 7000 p.p.m. respectively. The fluorine content of soft tissues from the control cows was 2 to 3 p.p.m. and these values were increased two to threefold by adding 50 p.p.m. of fluorine to the basal ration. This small difference in concentrations shows the unreliability of soft tissue analyses as a criterion of fluorine toxicosis. Mild to extensive exostosis developed in the metacarpal and metatarsal bones, particularly in the latter. Slight exostosis was observed on bone from cows fed 30 p.p.m., in which the bones of the legs contained 4000 or more p.p.m. of fluorine. [See also *V.B.* **28**, 1559 & 2996.]

MUSSILL, J. (1958). Tierärztliche Probleme des Industrieabbaues. [**Veterinary problems arising from industrial air pollution.**]—*Wien. tierärztl. Mschr.* **45**, 125-132. [Summaries in English and French.] **523**

It is often difficult to prove harm to domestic animals caused by industrial smoke, as the symptoms often resemble those of malnutrition and chronic disease, and the toxic doses are very small. In suspected cases the veterinarian should undertake clinical examination of the animals, chemical analysis of the organs, of the suspected smoke, and of soil and plants, observation of wind direction and rainfall, and comparison of the performance of the suspected animals and those in areas free from smoke.

—M.G.G.

HEIDRICH, H. J. (1958). Betrachtungen über die Vergiftung durch ein Düngemittel (Schwefelsäures Ammoniak-Kalkammonsalpeter) in einem Rinderbestand. [**Poisoning of cattle with a fertilizer.**]—*Prakt. Tierarzt* No. 2, pp. 33-36. **524**

Severe symptoms typical of nitrite poisoning developed in 9 of a herd of 28 dairy cows. One was slaughtered *in extremis*. P.M. examination revealed a brownish red discoloration of the abomasal mucosa, and petechial haemorrhages in the endocardium and epicardium. The other



8 recovered rapidly after i/v infusion of one litre of a 5% glucose soln. to which 2 g. of methylene blue and 10 ml. of "Ephedralin" [a combination of ephedrine and adrenaline] were added. Their mixed fodder was visibly contaminated with fertilizer, a mixture of ammonium sulphate, calcium carbonate, ammonium nitrate and sodium nitrate. This fertilizer had been used on crops growing alongside the fodder on the day that the fodder was harvested. Some of the literature on nitrate poisoning in cattle is reviewed, and the toxic dose, course, clinical picture, P.M. findings and mechanism of poisoning are summarized.

—M.G.G.

PAULET, G. (1957). Valeur des sels organiques du cobalt dans le traitement de l'intoxication cyanhydrique. [Value of organic cobalt compounds in treatment of cyanide poisoning.] — *C. R. Soc. Biol., Paris* **151**, 1932-1935. **525**

P. studied the action of cobalt gluconate and cobalt glutamate on anaesthetized dogs and cats, poisoned with sodium cyanide. The gluconate appeared to be the more effective: i/v inj. of 1.5 mg./kg. body wt. protected the animal from previous i/v inj. of a lethal dose of cyanide.

—R.M.

PREWITT, R. D. & MERILAN, C. P. (1958). Effect of potassium nitrate intake on dairy calves. — *J. Dairy Sci.* **41**, 807-811. [Summary modified.] **526**

This study provides information on the effects of level, frequency, and duration of nitrate intake on the nitrate tolerance of calves. Administration of  $\text{KNO}_3$  to bull calves indicated that the m.l.d. for initial intake was in excess of 30 g. per 100 lb. body wt. Toxic response to the compound varied between animals, but was not materially affected by method of intake (by capsule or dissolved in milk). The level of  $\text{KNO}_3$  ingestion exerted little, if any, influence on the time required for the *in vivo* formation of maximal levels of methaemoglobin (determined spectrophotometrically). Up to 1.3 g.% nitrate, but no nitrite, was detected by microbiological assay of the urine from two calves receiving 25 g.  $\text{KNO}_3$  per 100 lb. body wt. and showing low levels of methaemoglobin.

HEYWANG, B. W., GASSNER, F. X. & THOMPSON, C. R. (1958). Effect of feeding 2, 5-di-tert-butyl-hydroquinone and 2, 5-di-tert-amyl-hydroquinone to chickens.—*Poult. Sci.* **37**, 839-844. [Authors' summary modified.] **527**

2, 5-di-tert-butyl-hydroquinone caused

initial acute toxic symptoms in eight-week-old chickens when given as a drench at levels of 2-10 g./kg. body wt. 10 g./kg. body wt. caused 50% mortality in 84 hours.

Chronic toxicity studies showed that, when fed at 0.25% of the diet, it was much more toxic than the amyl derivative. Chronic toxicity symptoms were violent trembling, reduction in growth, some mortality, reduced egg production, and impaired hatchability. The chickens seemed to become accustomed to the butyl derivative after a time.

Feeding 0.25% of the amyl derivative for an extended period caused a slight growth depression but no other effects. With 0.025 and 0.075% of the amyl compound no deleterious symptoms were observed. No well-defined changes were detected by microscopic examination of liver, spleen, kidney, or gall-bladder which could be correlated with the continued ingestion of either of the two compounds.

KINGSBURY, J. M. (1958). Plants poisonous to livestock. A review.—*J. Dairy Sci.* **41**, 875-907. **528**

A general review is given of the plants in the U.S.A. known or suspected to be toxic for livestock. The treatment of the subject stresses the nature of the plant toxic principle and the importance of accurate botanical identification and use of systematic nomenclature. The toxic substances reviewed are alkaloids, glucosides (cyanogenetic, saponic, and others), organic acids, minerals, nitrates, selenium, molybdenum, resins, phytotoxins, photosensitizing agents and a number of unknown principles. Plants which cause mechanical injury are also mentioned. Valuable lists, complete with references, are given of the plants containing the various types of toxic substances and the final reference list is comprehensive.

—A. B. PATERSON.

FORGACS, J., KOCH, H., CARLL, W. T. & WHITE-STEVENS, R. H. (1958). Additional studies on the relationship of mycotoxins to the poultry hemorrhagic syndrome.—*Amer. J. vet. Res.* **19**, 744-753. **529**

Sterile grain on which a strain of *Penicillium rubrum* or *P. purpurogenum* had been grown caused depression, failure to gain weight, and eventually death when fed to chicks. P.M. findings included haemorrhages and congestion in various sites, erosion of the proventriculus and gizzard, and pallor of the bone-marrow. A supplement of proteins, minerals and vitamins reduced the damage: the addition of chlortetracycline reduced it still further. Strains of six

different fungi inoculated into moist broiler mash free from coccidiostat or antibiotic produced toxic substances within six days and caused the typical lesions of the poultry haemorrhagic syndrome. Toxic fungi also proliferated in food scattered by chicks on wood shavings litter and the birds developed typical lesions. Addition of 200 p.p.m. chlortetracycline to the food did not reduce the fungal growth but did result in less illness in the chicks. The factors which bring about the haemorrhagic syndrome are discussed. Not all saprophytic fungi produce the toxic substance.—E. G. WHITE.

EVANS, I. A., THOMAS, A. J., EVANS, W. C. & EDWARDS, C. M. (1958). **Studies on bracken poisoning in cattle. Part V.**—*Brit. vet. J.* **114**, 253-267. **530**

Attempts to prevent the development of bracken poisoning in cattle by daily injections of thiamine, cyanocobalamin, folic acid and leucovorin were unsuccessful. Experimentally induced poisoning was treated successfully by i/m or i/v inj. of a preparation containing batyl alcohol combined with i/m inj. of penicillin or oxytetracycline, providing there were not less than 2,000 leucocytes and 50,000-100,000 platelets per cu.mm. of blood. Below these values, death from haemorrhage and secondary infection invariably occurred. 20 of 27 field cases recovered after receiving this treatment.—R.M.

BARNES, J. E. (1958). **Georgina poisoning of cattle in the Northern Territory.**—*Aust. vet. J.* **34**, 281-290. [Author's summary.] **531**

A disease of cattle and goats known as Georgina poisoning occurs in the Northern Territory along the Georgina River watershed, caused by the leaves and pods of the Gidyea tree (*Acacia georginae*). The incidence, economic importance, and description of the disease are presented, with the results of feeding trials as evidence against the Gidyea tree. The description and distribution of the tree are stated; the variation in its toxicity and chemical work undertaken to elucidate this aspect are discussed. Recommendations are made for the control of the disease.

HALL, W. T. K. (1958). **Tests on grasstree poisoning.**—*Qd agric. J.* **84**, 299-301. **532**

After quoting some results of feeding tests with *Xanthorrhoea hostile* previously published [*V.B.* **27**, 1890], H. reports that *Xanthorrhoea* sp. aff. *media* affected a heifer after 156 lb. had been eaten in 55 days.—A. CULEY.

SERRANO, P. (1958). Empoisonnements par le "chardon à glue" *Atractylis gummifera* L. observés sur un troupeau de porcs dans la région de Saïda (Algérie). [Poisoning of pigs with *Atractylis gummifera* in Algeria.]—*Rev. Méd. vét.* **109**, 23-30. **533**

*A. gummifera* is a thistle from which gum tragacanth is obtained. It was suspected that ingestion of roots of the plant caused the death of 98 of a herd of 204 pigs. Only pigs let out into a field were affected. All the pigs died within 5 days, showing intense salivation, vomiting and constipation. Lesions observed were congestion of the gastric and intestinal mucosa, haemorrhagic gastric lymph nodes, empty small intestine but full large intestine.—R.M.

HEBAUER, O. (1958). Karyometrische Untersuchungen zur Frage der Genese von experimentellen Leberzirrhosen und Lebertumoren nach chronischer Seneciovergiftung. [Changes in nuclei of liver cells during chronic senecio poisoning in rats.]—*Inaug. Diss., Munich* pp. 53. **534**

Rats were poisoned by administration in the food of a mixture of *Senecio vulgaris*, *S. jacobaea* and *S. paludosus* in gradually increasing proportion over 9 months. 9,300 nuclei in liver cells from 24 rats were measured by the method of Caspersson & others [*Hereditas, Lund* **39**, 201 (1953)]. In poisoned rats the nuclei were about 6 times larger than in normal rats.—R.M.

CONLEY, B. E. (1958). **Studies on chemical protection against the lethal action of parathion.**—*Arch. int. Pharmacodyn.* **116**, 375-388. **535**

The methyl iodine of 3-pyridine aceto-hydroxamic acid ("RO 2-9174") protected rats from poisoning with 1.5 lethal doses of intraperitoneally administered parathion. It was administered i/p in up to 3 doses each of 400 mg./kg. body wt., between 15 and 120 min. after injection of parathion.—R.M.

KLIMMER, O. R. & PFAFF, W. (1958). Toxikologische Untersuchungen bei der praktischen Anwendung des systemischen Insekticide O,O-Dimethyl - (äthyl - thioäthyl) - thiophosphorsäureester. [Toxicological studies on the insecticide O,O-dimethyl-(ethyl-thioethyl)-thiophosphoric acid ester under practical conditions of its use.]—*Arzneimittelforsch.* **7**, 365-369. **536**

This insecticide is also known as "Metasystox" and is used as a spray to control plant pests. It had no apparent toxic effect on human volunteers or on dogs, even when used in the confined space of a greenhouse.—R.M.



## PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease.)

SCHULZ, C. W. (1958). **Tranquilizers in large animal medicine.**—*Vet. Med.* **53**, 73-76. **537**

Promazine hydrochloride was used to obtain sedation for surgical procedures in horses and cattle, particularly for examination of the penis. The drug was administered i/v in single doses ranging from 250 to 750 mg.—R.M.

STÖBER, M. (1958). Über die Wirkung und Anwendung neuerer Phenothiazinderivate (sog. "Tranquilizer") beim Rind. [**Action and uses of the new phenothiazine derivatives in cattle.**]—*Dtsch. tierärztl. Wschr.* **65**, 229-235. [Summary in English.] **538**

After reviewing the literature on the veterinary uses of chlorpromazine, S. reported trials with this tranquilizer and with propionylpromazine in over 150 cattle. Dosages, indications, and effects on behaviour, locomotion, blood circulation, digestion, respiration, parturition, and on the penis are described.—M.G.G.

FEURT, S. D., JENKINS, J. H., HAYES, F. A. & CROCKFORD, H. A. (1958). **Pharmacology and toxicology of nicotine with special reference to species variation.**—*Science* **127**, 1054-1055. **539**

The authors tabulated the minimum paralytic dose and lethal dose of nicotine, administered by i/m inj., for horse, ox, pig, goat, dog, cat, g.pig, rabbit, rat, mouse, chinchilla, deer, monkey and pigeon. They concluded that the drug was suitable for safely inactivating wild or dangerous animals by means of the rifle-fired syringe previously described [*V.B.* **27**, 3140].—R.M.

BROWN, K. I. (1958). **A preliminary report on the influence of sulfaquinoxaline on adrenal physiology in the domestic fowl.**—*Poult. Sci.* **37**, 779-781. [Author's summary.] **540**

Sulfaquinoxaline (0.0125%) fed continuously in the ration of broiler strain New Hampshire chicks for eight weeks decreased the amount of glucocorticoids in the birds' adrenals.

ALEXANDER, F., MACKIE, A., GHATGE, N. & WADDELL, A. W. (1958). **Some observations on the fate of phenothiazine and oxidation products in rabbits and sheep.**—*Arch. int. Pharmacodyn.* **113**, 254-260. [Discussion modified.] **541**

The fate of phenothiazine in sheep was different from its fate in rabbits, because phenothiazine was present in the urine of treated sheep but absent from the urine of treated rabbits.

After oral administration of the sulphoxide, phenothiazine was recovered from the urine of sheep but not from the urine of rabbits. Phenothiazone was the only recognisable derivative of phenothiazine in the urine of treated sheep and rabbits. Contrary to the findings of other authors, no thionol was detected in the urine of treated animals.

ENGLISH, P. B. (1958). **Penicillin blood levels in the horse with fortified benzathine.**—*Aust. vet. J.* **34**, 82-88. **542**

Fortified benzathine, containing 50% benzathine (N, N dibenzylethylenediamine dipenicillin G), 25% procaine, and 25% potassium penicillin, was injected i/m into horses weighing from 232-453 kg. Dose rates of 11,300,000 units/horse, 25,000 units/kg. and 50,000 units/kg. were used. Serum concentrations were determined over 120 hours. The three dose rates all gave similar concentrations and persistence of penicillin. When the dose was divided and given into four sites there was no significant increase in the rate of adsorption or in the blood levels and no decrease in the persistence of the blood levels. Mean serum penicillin levels ranged from 0.6 to 3.35  $\mu\text{g.}/\text{ml.}$  at one hour to 0.027 to 0.04  $\mu\text{g.}/\text{ml.}$  at 120 hours.

One horse dosed on four occasions at 14-day intervals developed an anaphylactic type reaction. Within 30 sec. of the fourth i/m injection it fell to the ground, showed marked respiratory distress but regained the standing position within 10 min.—R. N. WEAVER.

ZISCHKA, W. & PROHASKA, E. (1958). Über die Ansiedlung von oral applizierter tetracyclin-resistenter *Escherichia coli* im Darm während der Therapie mit Antibiotica der Tetracyclinreihe. [**Establishment of tetracycline-resistant *E. coli* in the intestine during therapy with tetracycline antibiotics.**]—*Zbl. Bakt. I. (Orig.)* **172**, 433-436. [Summaries in English, French, Spanish and Russian.] **543**

Resistance to tetracycline was used as a means of identifying *E. coli* recovered from faeces of human beings after oral administration. The bacteria multiplied only when the normal intestinal flora was changed by prior administration of the tetracycline antibiotics.—R.M.

GORDON, H. A., WAGNER, M. & WESTMANN, B. S. (1958). **Studies on conventional and germ-free chickens treated orally with antibiotics.** In "*Antibiotics Annual*" 1957-58. pp.

248-255. [New York: Medical Encyclopedia Inc.] **544**

The authors elaborated their earlier experiments on the effects of oral administration of procaine penicillin and other antibiotics to ordinary and germ-free fowls. They confirmed that the similarity between untreated germ-free fowls and antibiotic-treated ordinary fowls was probably due to absence of a physiological gut flora in the former and partial neutralization of the flora in the latter.—R.M.

AMMANN, K. (1958). ACTH, Cortison und seine Derivate in der Veterinärchirurgie und -augenheilkunde. [**Corticotrophin, cortisone and its derivatives in veterinary surgery and ophthalmology.**] — *Schweiz. Arch. Tierheilk.* **100**, 236-265. [Summaries in English, French and Italian.] **545**

The author reviewed the applications of these drugs in local aseptic inflammations of bone and synovial cavities, tendinitis, disorders of the intervertebral disks, peripheral paralysis, excessive granulation, haematoma, tumours, surgical operations, and laminitis, and sum-

See also *absts.* **312** (TB.); **321** (*Escherichia coli* infection); **335-336** (leptospirosis); **349 & 353** (fungistatic substances); **374** (toxoplasmosis); **385** (pox diseases); **429 & 434-437 & 535-536** (parasiticides); **439-445, 448-449, 451, 453-455 & 459-461** (anthelmintics); **601** (antibiotics annual).

## PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

STURKIE, P. D. (1958). **A survey of recent advances in poultry physiology.**—*Poult. Sci.* **37**, 495-509. **547**

This survey is confined mainly to limited aspects of the subject, and to work appearing since 1953. Chemical constituents of the blood, especially the plasma proteins and blood calcium, are discussed, and also blood pressure. Diet and atherosclerosis and certain work on electrocardiograms are also reviewed. A section deals with energy metabolism and digestion, paying especial attention to respiratory quotients.

The main part of the review is devoted to endocrinology and includes sections on reproduction in the female, moulting, the parathyroids and oestrogen in regulation of blood and shell calcium. The anatomy and histology of the hypophysis are discussed and also prolactin, the gonadotrophic, growth and thyrotropic hormones and finally, the effects of neurohypophysectomy.—E. J. CASTLE.

FINDLAY, J. D. (1958). **Physiological reactions of cattle to climatic stress.**—*Proc. Nutr. Soc.* **17**, 186-190. **548**

A review of the recent literature on the effects of heat stress on European breeds of

cattle, which demonstrates their general inability to adapt themselves with consequent decrease in food intake and changes in milk production. The dangers of applying knowledge gained from experiments on heat stress in man, directly to cattle, are stressed.—JOYCE E. HAMMANT.

CAMPBELL, J. R. & LAWSON, D. D. (1958). **The signs and stages of anaesthesia in domestic animals.**—*Vet. Rec.* **70**, 545-550. [Authors' summary modified.] **546**

A classification of the signs and stages of anaesthesia described by Guedel (1937) was employed, with minor modifications, for determining the depth of anaesthesia in animals. The action of anaesthetic drugs and their effects on vital functions is discussed. Major stress is laid upon effects on respiration, since this is the most important factor employed in the assessment of the depth of anaesthesia. The other signs which may be used as an aid in assessing the level of anaesthesia; eye signs, muscle tone, etc., are also discussed and their significance stated.

The influence of oxygen want and of variations of carbon dioxide tensions are discussed and the main actions of the principal volatile anaesthetic agents given.

JOHNSTON, J. E., HAMBLIN, F. B. & SCHRADER, G. T. (1958). **Factors concerned in the comparative heat tolerance of Jersey, Holstein and Red Sindhi-Holstein (F<sub>1</sub>) cattle.**—*J. Anim. Sci.* **17**, 473-479. **549**

The reaction to high temperatures and high humidities was observed in 9 lactating and 12 non-lactating Jersey, Holstein and Red Sindhi-Holstein crossbred cattle. Measurements were made of body temp., respiratory rate, respiratory minute volume, body weight, surface area, heat production, food intake, milk yield, serum protein-bound iodine, respiratory vaporization and oxygen consumption. The total heat production and heat production per unit surface area were smaller in the Red Sindhi-Holsteins than in the other breeds, and this would appear to explain their greater heat tolerance. All animals showed a decrease in heat production towards the end of the 30 day experiment, suggesting an



adaptation mechanism. Serum protein-bound iodine levels followed the changes in heat production.—E. J. CASTLE.

MOUNT, L. E. (1958). **The oxygen consumption of the new-born pig in relation to environmental temperature.**—*J. Physiol.* **142**, No. 1 p. 37P of Proceedings. 550

The oxygen consumption at temperatures between 16°–38°C. was measured in eight piglets aged 10–18 hours with a weight range of 0.94–1.76 kg., each from a different litter. The oxygen consumption rose threefold as the temp. decreased to 20°C. This increase in the metabolic rate of new-born pigs, which was unaffected by previous feeding, agrees with that found in older animals.—JOYCE E. HAMMANT.

MOUNT, L. E. (1958). **Change in oxygen consumption of the new-born pig with a fall in environmental temperature.** — *Nature, Lond.* **182**, 536–537. 551

The author has previously observed an increase in oxygen consumption by new-born pigs when the environmental temp. fell from 38° to 20°C. It was stated by Holub & others [*V.B.* **28**, 3023] that piglets did not react in this way to temporary exposure to 3°C. M. therefore repeated the experiments described by these authors, and found that new-born piglets responded to a drop in environmental temp. from 23° to 3°C. by almost doubling their heat production. He suggested that the conflicting results may have been due to differing constitution of the pigs used or to a difference in experimental procedure.—R.M.

NICOL, T., BILBEY, D. L. J. & WARE, C. C. (1958). **Effect of splenectomy on the phagocytic activity of the reticulo-endothelial system.**—*Nature, Lond.* **182**, 534–535. 552

Splenectomy in mice caused a decrease in phagocytic activity for about 4 days. This appeared to result mainly from the effect of anaesthesia and surgical procedure. Phagocytic activity returned to normal quicker in splenectomized mice than in mice subjected to laparotomy only.—R.M.

NELLOR, J. E. & REINEKE, E. P. (1958). **Hormonal control of mammary growth and lactation in the goat.**—*J. Dairy Sci.* **41**, 789–794. [Summary modified.] 553

Mammary growth and lactation were induced in kids and mature goats by weekly injections of macrocrystalline stilboestrol alone, or of macrocrystalline progesterone and stilboestrol in combination at ratios of 40:1, 80:1, and 1,000:1. Sexually mature goats were distinctly

more responsive to the treatments than 8-month-old goats. Although all reached approx. the same peak production 7 months from the start of the experiment, a more rapid onset of lactation was noted where progesterone and stilboestrol were combined in the treatment. Two goats approached closely the level of production recorded in the subsequent normal lactation. However, most of them were considerably below this level. No clear-cut indications were found for an optimum ratio between progesterone and oestrogen for the induction of mammary and lactation in the goat.

WASSERMAN, R. H., LENGEMANN, F. W. & COMAR, C. L. (1958). **Comparative metabolism of calcium and strontium in lactation.**—*J. Dairy Sci.* **41**, 812–821. [Summary modified.] 554

Metabolism of calcium and strontium in lactating and dry goats was studied, using double tracer methods. At steady state, Ca was preferentially secreted into milk by a factor of about 11 over Sr in its passage from diet to milk. With corollary data from dry animals, it was found that the largest amount of discrimination took place in the gastro-intestinal absorption of these alkaline earths, absorption of Ca being from 3–4 times that of Sr. These studies indicated that there is no differential movement of Ca and Sr between blood and bone, and that Sr is preferentially excreted in the urine.

EVANS, J. V., HARRIS, H. & WARREN, F. L. (1958). **Haemoglobin and potassium blood types in some non-British breeds of sheep and in certain rare British breeds.**—*Nature, Lond.* **182**, 320–321. 555

Sheep may be classified into types A, B or AB depending upon their possession of one or another or two distinct haemoglobins, and may be further classified independently of haemoglobin type into two types, HK and LK depending upon whether their blood potassium tends to be high or low. Both sets of characters are determined genetically and are situated at different loci in chromosomes. Examinations for haemoglobin and potassium blood types were carried out in 14 breeds of sheep from Finland, Iceland, Norway, Israel, Iraq, Egypt, Tanganyika, Nigeria, Australia, France and Canada. The distribution of haemoglobin types in the Scandinavian breeds, in which haemoglobin A is common, differs strikingly from that found in Middle Eastern and African breeds in which haemoglobin B preponderates. On the other hand, LK is infrequent in the Scandinavian countries and the Middle East and Africa, and

the high frequencies of haemoglobin B and LK which occur in British lowland breeds are not evident. (Northern mountain and hill breeds of sheep in Britain have rather high frequencies of A and HK.) Merino sheep form a distinctive group with both types of haemoglobin common but with almost exclusive occurrence of LK. The authors discuss the difficulties of interpretation which occur within the HK group as a result of the occurrence of 4 types of sheep, Ke $\alpha$ , Ke $\beta$ , Ke $\gamma$ , and Ke $\Delta$  with distinctive concentrations of K and Na in the red cells. In Britain HK usually implies Ke $\gamma$  but in the Middle East and Africa Ke $\beta$  and Ke $\Delta$  may be quite common.

Examination of the rare breeds Mouflon, Barbary, Jacob's, Manx, Soay, and Old Norfolk Horn showed 4 of the 6 breeds to be polymorphic in respect of one or other of the two sets of characters.—A. B. PATERSON.

VAN DER HELM, H. J. & HUISMAN, T. H. J. (1958). **The two hemoglobin components of the chicken.**—*Science* **127**, 762. 556

Blood samples from over 50 fowls were examined by paper electrophoresis and the presence of two distinct haemoglobin components was confirmed. These were separated completely by chromatography and their amino-acid composition compared. Both components were completely different from any human haemoglobin.

—E. J. CASTLE.

BELL, D. J. (1958). **Levels of two erythrocyte 'non-protein nitrogen' (NPN) fractions of hens in different physiological states.**—*Biochem. J.* **69**, No. 3 pp. 42P-43P of Proceedings. 557

Observations are made on non-protein nitrogen (NPN) in plasma and erythrocytes in 12 laying, 12 non-laying hens, and 12 chicks (6 weeks old) after feeding. The values of plasma nitrogen were similar to those recorded by other investigators. Rapidly growing birds had more total NPN in their erythrocytes than did adult birds. Although the total NPN concentration in erythrocytes was similar in both groups of adults, that estimated by the ninhydrin method was significantly less in the layers.

—JOYCE E. HAMMANT.

BLAIR, G. W. SCOTT. (1958). **The flow of blood in relation to the vessel wall.**—*Nature, Lond.* **182**, 90-91. 558

This is a short account of a meeting held in London on 13th June 1958, which included a paper by Dr. G. W. Scott Blair entitled 'A survey of work on flow of blood through tubes' and one by Dr. A. L. Copley, giving the results of his experiments with blood in viscometers.

Dr. P. H. Staple described his *in vivo* observations on the plasmatic zone in capillary beds and Prof. M. H. Knisely showed a film illustrating the movement of red and white cells in the living animal. Finally Dr. F. K. Beller read a short communication on micro-coagulation processes on the vessel wall.—E. J. CASTLE.

BELL, F. R. (1958). **A comparison of the regurgitation phase of rumination with the act of vomiting.**—*Brit. vet. J.* **114**, 268-272. [Author's summary modified.] 559

The effects of apomorphine on very young calves and goats were studied. Emesis did not occur but other related signs such as salivation, swallowing, chewing, defection were very prominent. Copper sulphate as a peripheral emetic was also tested on very young calves and goats but produced no signs or symptoms or change in demeanour or behaviour. Hyoscine hydrobromide, an anti-emetic, had no inhibitory effect on rumination in adult cows.

The possible relationship of vomiting and regurgitation is discussed in relation to the disposition of neural elements in the medulla oblongata.

KELLER, P. J., COHEN, E. & NEURATH, H. (1958). **The proteins of bovine pancreatic juice.**—*J. biol. Chem.* **233**, 344-349. [Authors' summary modified.] 560

A chromatographic system was developed for the quantitative separation of the protein components of bovine pancreatic juice, obtained from steers with a permanent pancreatic fistula. With the use of cellulose ion exchange columns, 8 anionic protein components were separated. About 72% of the total proteins were proteolytic.

KOSTYRA, J. (1958). **Mielinizacja włókien w rdzeniu kręgowym krowy. [Myelination of nerve fibres in the spinal cord of the cow.]**—*Ann. Univ. Curie-Skłodowska, Sect. DD.* 1956 **11**, 119-146. [In Polish. Summaries in English and Russian.] 561

K. traced the development of myelinated nerve fibres in 23 fetuses between 77 and 770 mm. long and in young and adult cattle. Myelin first appeared in the spinal cord in the 17th week of pregnancy. The author distinguished 4 phases in myelination.—R.M.

WELENTO, J. (1958). **Jadra przedniej części rdzenia przedłużonego i mostu varola owcy i kozy. [The nuclei of the anterior part of the medulla oblongata and pons of the sheep and goat.]**—*Ann. Univ. Curie-Skłodowska, Sect. DD.* 1956 **11**, 65-107. [In Polish. Summaries in English and Russian.] 562



This is an extension of the author's previous studies on the medulla and pons of the cow, published in the same *Annales*, 1955 **10**, 185-237. It is a detailed account with 14 plates of photomicrographs of brain sections.—R.M.

MICHEL, G. (1958). Beitrag zur Anatomie des Thymus des Syr. Goldhamsters (*Mesocricetus auratus* W.). [**Anatomy of the thymus of the hamster.**] — *Zbl. VetMed.* **5**, 675-691. [Summaries in English, French and Spanish. English summary modified.] **563**

The structure and age involution of the thymus of the hamster were studied. The organ lies ventrally in the precardial mediastinal fissure and appears as a glandular body, indistinctly lobulated and composed of two main lobes united by connective tissue. Striking features are the very slight development of the interstitial tissue and the small number and size of the Hassall's corpuscles.

See also abstr. 602 (hook, morphology of the blood in laboratory animals).

## PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

MEARA, P. J. (1958). **A note on the antibiotic contamination of milk supplies as a veterinary and public health problem.**—*J. S. Afr. vet. med. Ass.* **29**, 113-127. **565**

A summary of the present position regarding antibiotics in milk. Penicillin and the other antibiotics are frequently present in herd milk in the U.S.A., Gt. Britain, and Europe, and probably also in S. Africa. Their presence may affect cheese-making, but bulking of farm milks into amounts of about 3,000 gal. usually dilutes sufficiently. The action depends on the antibiotic used and may be prolonged for as much as 4 days after aureomycin. Pasteurization either by the holder or flash processes does not destroy their action. There is a danger of human sensitization, and they interfere with dye reduction tests. Suggestions for prevention in S. Africa include education and instruction of farmers as to the necessity of discarding milk containing antibiotics, warning notices by the manufacturers on each pack, and the possible incorporation of a dye into the antibiotic which will discolour the milk.—W. K. DUNSCOMBE.

THORNTON, H. (1958). **Problems of slaughter and meat inspection and the need for their investigation by the research worker. Parts I & II.** — *Brit. vet. J.* **114**, 164-176 & 220-234. **566**

This paper formed the substance of the Benjamin Ward Richardson lecture to the Royal

Involution with age is characterized by diminution in size and weight, marked increase in connective tissue and increasing accumulation of fat in the cortex.

SCOTHORNE, R. J. (1958). **Histochemical study of the nasal (supra-orbital) gland of the duck.**—*Nature, Lond.* **182**, 732. **564**

No evidence was found that this gland secretes a serous or mucous material. The gland possessed an abundance of mitochondria in the eosinophilic secretory cells, which probably accounted for the moderate lipid content; a good blood supply and moderate amounts of alkaline phosphatase in the nuclei of cells at the periphery. The secretory elements were compared with the oxyntic cells of mammalian gastric glands and with the chloride excreting cells of the gills of euryhaline fishes. In preliminary experiments under conditions of salt loading, these nasal glands secreted chloride up to levels of 640 m. equiv./litre.—JOYCE E. HAMMANT.

Society of Health in December 1957. It gives some of the author's experiences in abattoirs at Newcastle-on-Tyne especially from the practical point of view in meat inspection.

Mention is made of "slaughter spleen", the possible retention of consciousness for longer than hitherto supposed in animals slaughtered by the Jewish method; capillary haemorrhages in pigs of unknown causation but which may be due either to invasion by larvae of *Ascaris lumbricoides* or to electrical stunning, and the present veto on electrical stunning of pigs in the U.S.A. is pointed out.

An important section deals with the problem of bone taint. The spoilage process may originate in the popliteal or prescapular lymph nodes and this may be of particular importance in cattle which are salmonella carriers. It is essential to cool the carcass quickly. It is stated that the tetracycline antibiotics may be used to delay spoilage; they may also be sprayed on meat afterwards or infused into it but cannot take the place of good hygiene. Their use has been permitted in the U.S.A. for poultry since 1955 and recently in Canada for poultry and fish.

[This is an interesting and practical report for meat inspectors. However, the use of the tetracyclines against bone taint is really indefensible. They are useless against organisms of proteus and pseudomonas type which are almost ubiquitous, a 250-mg. capsule for human use still costs 3/-, and they cannot take the place of

properly constructed premises with adequate lairage, cool and cold storage rooms, and pre-slaughter veterinary inspection. The risk that their use for the purpose mentioned may sensitize those using them or make organisms resistant is so great that such use is inadvisable.]

—W. K. DUNSCOMBE.

GINSBERG, A., REID, M., GRIEVE, J. M. & OGONOWSKI, K. (1958). **Chlortetracycline as a preservative for fresh meat and poultry.**—*Vet. Rec.* **70**, 700-704. [Authors' summary modified.] **567**

Chlortetracycline injected i/v or i/m into cattle 4 hours before slaughter delayed decomposition for up to 96 hours. Such an extension of the keeping time may prove of value in countries without refrigeration facilities. The i/m injection into the neck behind the occipital bone is suggested for commercial slaughter of cattle because of its simplicity and effectiveness. The

colour and texture of the treated beef were improved. Clostridial growth was controlled but not that of *Proteus vulgaris* and yeasts. The prolongation of the storage life of mutton and goat meat did not equal that of beef and depended on the quality of the carcass. Dipping eviscerated fowl carcasses into an aq. soln. containing 10 p.p.m. of chlortetracycline did not improve keeping quality. Only negligible amounts of antibiotic residue were found.

STENBERG, H. (1958). Helsinki. Valtion eläinlääketieteellinen laitos statens veterinärmedicinska anstalt. [**State Veterinary Medical Institute, Helsinki, 1908-1958.**] pp. 74. Helsinki: The Institute. [In Finnish. Summary in English.] **568**

A description of the history and work of the Finnish State Veterinary Institute, founded in 1908. There is a long English summary and a full list of publications by the staff.—R.M.

See also *absts.* **324** (ticks and rodents as disseminators of brucella); **397** (chlorination of sewage for control of swine fever).

## REPRODUCTION AND REPRODUCTIVE DISORDERS

KOLLER, R. (1958). Die Bedeutung der Psychosexualität für die Fortpflanzung unserer Haustiere. [**Importance of sexual psychology in reproduction of domestic animals.**]—*Zuchthyg. FortpflStörung. u. Besamung* **2**, 193-216. **569**

A review of the literature on psychological factors influencing natural reproduction and artificial insemination.—R.M.

TURKHEIMER, A. R., YOUNG, D. C. & FOOTE, R. H. (1958). **Technics for semen collection; semen production in young boars.**—*Cornell Vet.* **48**, 291-299. [Authors' summary modified.] **570**

Four of 22 boars produced first ejaculates between 18 and 19 weeks of age. Most boars evinced interest in the teaser by 6 and 7 months of age, and all except five were ejaculating by 10 months of age. Semen production increased rapidly as the boars approached a year of age. Six of the boars were housed individually during the period from 11 to 13 months of age. Separate pens were recommended for boars after reaching puberty in order to prevent pederasty. The average values for the different semen criteria for ejaculates collected from these boars were as follows: total volume, 245 ml.; strained volume, 177 ml.; gel volume, 68 ml.; spermatozoa concentration  $275 \times 10^6$  per ml.; percentage of motile spermatozoa 58; total spermatozoa per

ejaculate  $47 \times 10^9$ ; and pH, 7.5. Semen from this group of boars used for artificial insemination was found to be fertile.

WHITE, I. G. & GRIFFITHS, D. E. (1958). **Guanidines and phosphagens of semen.**—*Aust. J. exp. Biol. med. Sci.* **36**, 97-101. [Authors' summary modified.] **571**

The authors determined the distribution of guanidines in bull, dog, fowl, human, rabbit and ram seminal plasma and spermatozoa. No evidence was obtained for the presence of phosphagens or N-amidinophosphokinases in the seminal plasma or spermatozoa of any of these species.

NOYES, R. W., ADAMS, C. E. & WALTON, A. (1958). **Transport of spermatozoa into the uterus of the rabbit.**—*Fertil. & Steril.* **9**, 288-299. **572**

Neither radio-opaque media nor semen normally pass from the vagina into the uterus during copulation or following artificial stimulation of the vulva. Living spermatozoa pass through the cervical barrier as the result of their own motility, but the exact point at which their rate of progress is first influenced by muscular contractions of the genital tract has not been established.—R.M.

BLOM, E. & CHRISTENSEN, N. O. (1958). **Cysts and cyst-like formations (inter alia spermio-**



stasis) in the genitals of the bull. **Studies on pathological conditions in the testis, epididymis and accessory sex glands in the bull. IV.** —*K. VetHøjsk. Aarsskr.* pp. 101-133. [In English.] 573

2,000 adult bulls, 1,200 calves (8-12 months old) and 4,966 new-born calves were investigated. Epididymal cysts were found in 18 cases, cysts around the ampulla and vesicles in 5 and in the prostate and bulbo-urethral glands in 4. These are to be distinguished from the results of brucellosis and from segmental aplasia of the Wolffian duct. The bilateral epididymal cysts produce spermiostasis; such bulls should be excluded from artificial insemination although hereditary transmission is not yet proven. Small cyst-like "paradidymal" bodies and also Müllerian cysts (uterus masculinus) were found in 24-46% of the new-born calves.

—F. L. M. DAWSON.

ROTTENSTEN, K. (1958). Undersøgelser over de ydre brunstsymptomer og forskellige forhold i forbindelse hermed. [Observations on external signs of oestrus and related events in cattle.] —*Beretn. Forsøgslab. Kbh.* No. 306, pp. 28. [In Danish. Abst. from English summary.] 574

Scores of 1-4 points were allocated to individual oestrous periods according as they were doubtful, weak, normal, or unusually well-evidenced in the attendants' opinion. Data were collected from first-calf heifers sired by 38 bulls in progeny testing stations. Although there was variation between different heats in the same animal, R. concluded that there was significant variation within and between daughter groups. Among 346 repeat breeders, mean intensity of heat was slightly higher when conception took place than previously. Jerseys showed a slightly higher mean intensity than Red Danish or Friesians. Post-oestral bleeding at 49-72 hours was observed after 27% of heats—higher in some daughter groups. There was no correlation with other factors.—F. L. M. DAWSON.

MORRISON, R. A. & ERB, R. E. (1957). **Factors influencing prolificacy of cattle. 1. Reproductive capacity and sterility rates.**—*Tech. Bull. Wash. agric. Exp. Sta.* No. 25, pp. 39. 575

Records were analysed from 2,607 Friesian cows, involving 9,994 reproductive periods. Infertility was the sole cause of disposal in 18%. Retained placenta was associated with 10.3% of parturitions and with 43.8% of twin births. It was four times as common after the 7th calving as after first calving. Following the elimination of brucellosis, the overall abortion rate was 5%.

Between two normal calvings cows averaged 2.12 services per live calf, with an interval of 424 days.—F. L. M. DAWSON.

VELLE, W. (1958). **Studies on oestrogens in cattle. On the metabolism of oestradiol-17alpha in the young calf.**—*Acta endocr., Copenhagen* 29, 109-114. [In English.] 576

The author has previously demonstrated that oestradiol-17beta is transformed into oestrone and oestradiol-17alpha, and that oestrone is also transformed into the 17alpha isomer in calves. He now reports that when this isomer was injected i/m into calves, part was excreted unchanged in the urine and part was excreted as oestrone.—R.M.

DODSON, M. E. (1958). **The use of some of the naturally occurring hormones in the treatment of certain types of bovine infertility.**—*Aust. vet. J.* 34, 291-295. 577

A limited number of infertile cows were treated with oestradiol, follicle stimulating hormone, and luteinizing hormone. The value of the treatment is difficult to assess but is related to the cost and the reduction of the infertile period.—A. W. BLACKSHAW.

PINCUS, G. & HOPKINS, T. F. (1958). **The effects of various estrogens and steroid substances on sex differentiation in the fowl.**—*Endocrinology* 62, 112-118. 578

Hormones were introduced into fertile eggs by dipping the eggs for between 5 and 20 sec. into solutions of the hormones. Results obtained were similar to those obtained by injecting the hormones through the shell.—R.M.

SHONE, D. K., PHILIP, J. R., ROBERTS, R. M. & CHRISTIE, G. J. (1958). **Some aetiological agents of bovine abortions in Southern Rhodesia.**—*J. S. Afr. vet. med. Ass.* 29, 55-62. 579

From October 1956 to September 1957 material from 79 bovine foetuses was examined in Salisbury. The agents considered responsible were Rift Valley fever virus (8), fungi (3), *Brucella abortus* (2), *Vibrio fetus* (2), *Babesia bigemina* (2) and *Corynebacterium pyogenes*, *Salmonella enteritidis*, streptococci and *Lantana camara* poisoning (1 each). The causes of the remaining 58 abortions could not be determined from the material submitted. Unexplained abortions were particularly frequent in January and in July-August.—E. G. WHITE.

ANON. (1958). **Notes on animal diseases. XX. Breeding diseases of cattle.**—*E. Afr. agric. J.* 23, 211-223. 580

Epididymitis and vaginitis, trichomoniasis,

and vibriosis are considered to cause the greater part of the widespread infertility. African stock act as symptomless carriers and there is circumstantial evidence of coital transmission of the putative virus infection. Epidemiology is described in considerable detail. About 20% of cows develop a blocking salpingitis. There is no evidence as to whether "recovered" European cows become carriers. The account of trichomoniasis, which is widespread, lays much emphasis on the efficiency of immunity in the cow. [It is stated that a female calving normally to the infecting service will be clean by the first subsequent oestrus. This is not always so.—Abstractor.]—F. L. M. DAWSON.

LAMOND, D. R. (1958). **Infertility associated with extirpation of the olfactory bulbs in female albino mice.**—*Aust. J. exp. Biol. med. Sci.* **36**, 103-108. **581**

The removal of the olfactory bulbs of immature and mature female mice produced infertility in a proportion of animals.

It was suggested that the operation altered psychic phenomena including oestrus and reduced the chance of successful mating.

—A. W. BLACKSHAW.

HUGHES, A. M. & CALVIN, M. (1958). **Production of sterility in mice by deuterium oxide.**—*Science* **127**, 1445-1446. **582**

A mixture of 1 part deuterium oxide ("heavy water") and 2 parts H<sub>2</sub>O was given as drinking water to mice for 2 months. A high proportion of the mice were sterile when they were mated at the end of the 2 months. The mode of action of D<sub>2</sub>O is being investigated.

—R.M.

See also absts. 322 (brucellosis and sterility); 334 (leptospirosis); 341-342 & 363 (vibriosis); 343 (infections of bovine uterus and cervix).

## ZOOTECHNY

STADELMAN, W. J. (1958). **Observations with growing chickens on the effects of sounds of varying intensities.**—*Poult. Sci.* **37**, 776-779. [Author's summary modified.] **586**

Broiler chickens were grown without loss or weight differences in areas subjected to sound levels in excess of 110 decibels in the 20 to 10,000 cycles per sec. range with maximum intensity in the 150 to 1,200 cycles per sec. range.

It was evident that loss in a pen of broiler chickens is much more likely to occur from an isolated low level fly-over than from continuous noises resulting from close proximity to an airfield.

GREEN, F. R. & MORGAN, J. T. (1958). **The anatomy of a double pig.**—*Vet. Rec.* **70**, 704-706. [Authors' summary modified.] **583**

An example of syncephalus thoracopagus in the pig is reported. The hearts and circulatory system are described in detail as they differed from those in previously recorded cases.

BONFERT, A. & MAI, F. (1958). Beobachtungen über erbliches Auftreten von doppeltem Muttermund beim Rind. [**Hereditary duplication of the os uteri in cows.**]—*Zuchthyg. FortpflStörung. u. Besamung* **2**, 82-90. **584**

Duplication of the os uteri was found at artificial insemination in 18 of 2,310 Black Pied Lowland female cattle. The condition was associated with low conception rate and inflammation of the cervix and endometrium. Five bulls were identified as carriers of a recessive gene causing this condition.—M.G.G.

RHODE, E. A. & CORNELIUS, C. E. (1958). **Congenital porphyria (pink tooth) in Holstein-Friesian calves in California.**—*J. Amer. vet. med. Ass.* **132**, 112-116. [Authors' summary.] **585**

Two cases of congenital porphyria are reported in Holstein-Friesian calves. Clinical signs observed were a macrocytic normochromic anaemia, retarded growth, lesions of photosensitization, reddish brown teeth, bones, and urine, and the presence of pathological fractures. Blood and urine analyses and pathological findings are reported.

The results outlined in this report are based on reproduction of aircraft fly-over noises. It may be that actual fly-overs would have altered results because of shadow or other conditions. Sound alone applied from day-old to market age had no measurable effect on the chickens.

OTTE, B. (1958). Geschlechtsbestimmung bei 2-3 Tage alten weissen Mäusen. [**Determination of sex in mice 2-3 days old.**]—*Dtsch. tierärztl. Wschr.* **65**, 162-163. **587**

In male mice 2-3 days old the genital tubercle is more prominent, more pointed, and at a greater distance from the anal opening than in females. These differences are no longer apparent at 5-6 days of age.—M.G.G.



## TECHNIQUE AND APPARATUS

ZIEGLER, D. W., DAVIS, E. V., THOMAS, W. J. & McLIMANS, W. F. (1958). **The propagation of mammalian cells in a 20-liter stainless steel fermentor.**—*Appl. Microbiol.* **6**, 305-310. **588**

The technique was developed from that described by McLimans & others [*V.B.* **28**, 1975], who used 5-litre vessels for submerged culture of cells. Three types of cell were successfully propagated in the 20-litre apparatus. Its use for production of virus vaccines and other products was discussed.—R.M.

MCARTHUR, J. (1958). **A new concept in microscope design for tropical medicine.**—*Amer. J. trop. Med. Hyg.* **7**, 382-385. **589**

The microscope was in the form of a rectangular block measuring only 4 × 2.5 × 2 inches and weighing 18 oz. It was equipped with standard low power, high power, and oil-immersion lenses, a condensor, and built-in battery-operated illumination. Its uses included making blood counts and examining blood smears for protozoa. A photomicrograph taken on a moving bus in London is reproduced to demonstrate the portability of the instrument.—R.M.

KOHN, J. (1958). **A micro-electrophoretic method.**—*Nature, Lond.* **181**, 839-840. **590**

The method was designed for electrophoresis

of samples of a fraction of a microlitre with a protein content of 10 µg. or even less. "Nigrosin" was used as a stain. The method could also be applied to immuno-electrophoresis.—R.M.

RODDICK, B. J. (1958). **A one-man sheep-bleeding technique.**—*N. Z. vet. J.* **6**, 20. **591**

The sheep was placed in the sitting position, supported by the right leg of the operator. The head and neck were bent to the left of the animal and downwards by the operator's left hand. This exposed and distended the jugular vein, and also immobilized the animal, so that a hypodermic needle attached to a syringe could be inserted by the right hand. R. stated that 20-25 sheep could be bled in half an hour by this method.—R.M.

FREDRICKSON, T. N., CHUTE, H. L. & O'MEARA, D. C. (1958). **A simple improved method for drawing blood from chickens.**—*J. Amer. vet. med. Ass.* **132**, 390-391. **592**

Blood was collected from the left brachial vein by inserting a 20 gauge hypodermic needle, 4 cm. long. The inside of the needle and collecting syringe were wetted with heparin soln. to prevent clotting. A method of immobilizing fowls, suitable for single-handed working, was described.—R.M.

See also absts. **331-332** (cultivation of brucella); **363** (culture medium for *V. fetus* and *T. foetus* from preputial washings); **365** (counting oocysts); **372** (electron microscopy of bovine erythrocyte sections in anaplasmosis).

## MISCELLANEOUS

HEYNER, S. & BIGGERS, J. D. (1958). **Cultivation of isolated embryonic rat tibiae on a chemically defined medium.**—*Nature, Lond.* **182**, 810-811. **593**

The successful culture of embryonic chick femora and tibiae on a chemically defined medium was recently described [*V.B.* **28**, 1978]. It has since been possible to cultivate embryonic rat tibiae on a closely related, chemically defined medium, thus paving the way for future studies on the specific nutritional requirements and metabolism of growing mammalian cartilage.—R.M.

ANON. (1958). **A selected and classified list of books relating to agriculture, horticulture etc.**—*Bull. Minist. Agric., Lond.* No. 78. pp. 96. [London: H. M. Stat. Off. 4th Edit. 5s. 6d.] **594**

This is a catalogue of standard and recent books in the London library of the Ministry of Agriculture. It also contains numerical lists of bulletins and leaflets issued by the Ministry. Books are classified by subjects, and there is a small section on veterinary medicine and others on each of the farm animals.—R.M.

## REPORTS

UNION OF SOUTH AFRICA. (1958). **The South African Institute for Medical Research, Johannesburg. Annual Report for the year ended 31st December 1957.** pp. 107. Johannesburg: The Institute. **595**

The report deals chiefly with matters of

medical interest, and but little of purely veterinary importance. The diagnosis of several cases of RABIES was confirmed by the isolation of the virus from central nervous tissue from fatal cases.

From material collected during a severe

epizootic amongst sheep, a new arthropod-borne virus named Middleburg virus has been described.

The production of RABIES antiserum is now on a routine basis.—D. S. RABAGLIATI.

FEDERATION OF NIGERIA. (1958). **Annual report of the Department of Veterinary Research of the Federation of Nigeria for the year 1956-1957.** [TAYLOR, J. I.] pp. 23. Lagos, Nigeria, Federal Govt. Printer. 9d. **596**

Re-organization of the Department became necessary following the constitutional changes within Nigeria in 1954-55.

In January 1957, the first meeting of the West African Regional committee on epizootic diseases was held in Vom.

The main activity of the Division of Virology and Bacteriology was the production of vaccines. A total of 5,825,378 doses of all vaccines was produced. The Laboratory can now supply by far the greater part of the requirements of the four British West African Territories and is likely to continue to supply future needs.

The demand for vaccines—other than for RINDERPEST—increased, especially for NEWCASTLE DISEASE. Twenty-five cases of RABIES were confirmed in the Plateau Province. Research on rabies was hampered by shortage of staff, but the demand for rabies vaccine (avianized living Flury strain) increased.

Regarding bovine COCCIDIOSIS, the survey of the species occurring in Nigerian cattle was completed. A further species, *Eimeria wyomingensis*, was identified.

The number of students training varied from 47 at the end of the academic year to 59 at the start of the new session. 413 students have entered the school since 1941 and there are now 600 veterinary assistants in Nigeria.

—D. S. RABAGLIATI.

NORTHERN RHODESIA. (1958). **Department of Veterinary Services Annual Report for the year 1957.** [SWAN, J. F. C.] pp. 15. Lusaka: Government Printer. 2s. 6d. **597**

The most important disease was TRYPANOSOMIASIS, though RABIES, EAST COAST FEVER, TUBERCULOSIS and NEWCASTLE DISEASE all demanded attention. A disturbing factor was the loss of co-operation from stockmen in parts of the Southern Province.

Prophylactic inoculation against ANTHRAX and BLACKLEG is now normal practice amongst European owners and in some provinces for African-owned animals too. 111,000 doses of

trypanocidal remedies were used but dimidium bromide is now giving place to antrycide.

RABIES is still common and in the last three years some 60,000 dogs have been vaccinated. Breaks in immunity have been as low as 0.025%.

A severe outbreak of TB. was diagnosed with over half the herd reacting. The whole herd was slaughtered at the request of the owner.

—D. S. RABAGLIATI.

TANGANYIKA. (1958). **Annual Report of the Veterinary Department, 1956. Vol. II. Research, investigation and statistics.** [ARNOLD, R. M.] pp. 105. Dar es Salaam: Government Printer. Shs. 8/50. **598**

Changes were made in the organization of the Veterinary Research services at Mpwapwa, the various departments being integrated, and the Chief Veterinary Officer, Research, assumed responsibility for all aspects.

An outbreak of RIFT VALLEY FEVER occurred at Kongwa towards the end of February in which only calves were affected, of which 30 died. No other in-contact cattle were affected.

With the improvement in the over-all state of RINDERPEST, quick and accurate diagnosis became important. In four suspected outbreaks efforts to transmit the condition by inoculation of susceptible cattle were unsuccessful. An experiment to determine the value of adjuvant rinderpest vaccine in calves aged 12 months or younger, born to immune dams, was carried out. Immunity was judged by the temperature reaction of the calves to challenge with a standard dose of Kenya attenuated goat virus vaccine.

Single comparative tuberculin tests were carried out on all Government Farms, using P.P.D. tuberculin. Among 468 cattle on one farm, two positive and two doubtful reactors were found; of 725 cattle on the Veterinary Research Farm, two were positive and the same number (of 698 tested) on the Government dairy farm, Tanga. Six positive reactors were detected on another dairy farm of 176 head. A table is given showing the result of the P.M. examination of 11 non-specific reactors.

The two-year course for veterinary assistants continued at Mpwapwa. Arrangements to give the students as much practical work and field experience as possible were made.

The report ends with a number of statistical tables.—D. S. RABAGLIATI.

DENMARK. (1958). *Årsberetning fra Veterinærdirektoratet.* [Denmark: Annual report of



the Director of Veterinary Services for 1956.] [SCHRÖDER, K. C.] pp. 62. Copenhagen: J. H. Schultz A/S. [In Danish. Summary in French.] 599

There were only 6 outbreaks of FOOT AND MOUTH DISEASE during 1956; 318,000 animals were inoculated with bivalent vaccine. Ring tests on milk for BOVINE BRUCELLOSIS were negative for 99.8% of 177,000 dairy herds. Tuberculin tests were performed on 270 herds, and 224 reactors were slaughtered, with state compensation. The islands of Denmark were free from the WARBLE FLY and it was estimated that an average of 1.2% of cattle in Jutland were infested. The livestock population of Denmark in July 1956 was put at 282,000 horses, 3,168,000 cattle, 4,630,000 pigs, 34,400 sheep, 24,704,000 fowls and 238,000 mink.—R.M.

NETHERLANDS. (1958). 11e jaarverslag van de "Stichting Provinciale gezondheidsdienst

voor Dieren in Drenthe". 1 Mei 1956 - 30 April 1957. [11th annual report. Health Service for Animals in Drenthe Province, 1956-1957.] pp. 104. Assen: Van Gorcum. 600

The percentage of herds free from BOVINE TUBERCULOSIS was 99.72 in April 1957. Of 191,000 cattle tuberculin tested during the year, 88 reacted and were slaughtered. BOVINE BRUCELLOSIS was present in 10% of herds and 73% of herds were certified free from brucellosis. During the year 38,400 calves were inoculated with brucella vaccine. Vaccination was no longer compulsory and it was recommended that only calves in badly infected districts should be vaccinated, and only between 6 and 9 months of age; the future of vaccination was discussed. A plan for the control of bovine brucellosis was described, and regulations for this and for TB. were appended.—R.M.

## BOOK REVIEWS

WELCH, H. & MARTI-IBÁÑEZ, F. [Edited by.] (1958). **Antibiotics annual 1957-1958**. pp. xvii + 1070. New York: Medical Encyclopedia, Inc. \$12.00. 601

This volume contains over 157 papers on all aspects of antibiotics, their pharmacological and therapeutic action, and their practical use in medicine, veterinary medicine and food preservation. There are six papers of direct veterinary interest, dealing with oral administration of antibiotics to normal and germ-free fowls (H. H. Gordon & others); oleandomycin in poultry rations (W. C. Sherman & others); substances active against *Leptospira icterohaemorrhagiae* and *poimona* (J. S. Kiser & others); antibiotic douches for infertile cows (E. M. Sacchi & others); streptomycin in infectious synovitis in fowls (D. C. Shelton & N. O. Olson); comparison of antibiotics used for bovine mastitis (K. E. Price & others). These papers have been abstracted separately in the *Veterinary Bulletin*. Other topics include several papers each on antifungal antibiotics: combined therapy with gamma globulin and antibiotics; novobiocin; amphotericin; oleandomycin and its combined use with tetracycline; ristocetin. New drugs include a tetracycline phosphate complex, a quino-cycline group, telomycin, pimaricin and sulfocidin. Also mentioned are adverse reactions of human beings to antibiotics and the public health significance of antibiotic residues in food.—R.M.

SCHERMER, S. (1958). Die Blutmorphologie der Laboratoriumstiere. [Morphology of the

blood of laboratory animals.] pp. viii + 186. Leipzig: Johann Ambrosius Barth. 2nd Edit. DM 30.60. 602

This book describes not only the morphology of peripheral blood and blood cells in bone marrow, liver, spleen and lymph nodes, but also collection of blood, blood volume, sedimentation rate, viscosity, protein content (by electrophoresis), sugar, blood groups, and the reaction of the haemopoietic system to pyrogen. Each chapter deals with one animal, and the animals included are rabbit, guinea-pig, rat, mouse, hamster, dog, cat, sheep, monkey, fowl, pigeon, frog.

The first edition (1954) was a revision of the book of the same title by Klieneberger & Carl, which last appeared in 1926. Data given in "Standard values in blood" edited by E. C. Albritton [V.B. 24, 1673] have been incorporated in the present edition.

The arrangement of material is very orderly and there is no need for an index in order to locate information on a particular topic. For each animal there are two small coloured plates of blood cells, one showing peripheral blood and the other showing bone marrow. The method of collecting blood from each animal is also illustrated. Although the book is confined to normal haematology, some commonly occurring blood parasites are described. There is a list of references at the end of each chapter. This book is a valuable contribution to the haematology of animals.—R.M.

FOSKETT, D. J. (1958). **Information service in libraries.** pp. vii + 142. London: Crosby Lockwood & Son, Ltd. 13s. 6d. 603

This book describes the work of the librarian or information officer providing his specialist readers with an efficient information service. His services are twofold: (1) he keeps his readers informed of newly published work, (2) he supplies information and bibliographies on specific points when requested. Chapter VI, entitled "Reference Service", describes the

technique of seeking information, and will be of interest to the research worker who undertakes this himself. Sources of information are books, journals, particularly abstracting and indexing journals, national bibliographies, catalogues and accessions lists of specialist libraries, the information departments of Institutes and specialized journals, publishers' and booksellers' lists, and trade literature. The author considers that these services constitute true librarianship and that they will eventually become a feature also of the university and public libraries.—M.G.G.

### BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review.]

BAKER, J. K. (1958). **Principles of biological microtechnique. A study of fixation and dyeing.** pp. xv + 357. London: Methuen & Co. Ltd. 45s.

BARNES, D. E. & TAYLOR, D. (1958). **Radiation hazards and protection.** pp. x + 178. London: George Newnes Ltd. 30s.

BRION, A. (1958). **Vade-mecum du vétérinaire. Formulaire vétérinaire de pharmacologie, de thérapeutique et d'hygiène. [A veterinary vade-mecum. Pharmacology, therapeutics and hygiene.]** pp. xv + 752. Paris: Vigot Frères. 10th revised edit.

COHRS, P., JAFFÉ, R. & MEESSEN, H. (Edited by) (1958). **Pathologie der Laboratoriumstiere. [Pathology of laboratory animals. Vols. 1 & 2.]** pp. xix + 799 & xv + 803. Berlin (Göttingen & Heidelberg): Springer Verlag. DM 298.

ELTON, C. S. (1958). **The ecology of invasions by animals and plants.** pp. 181. London: Methuen & Co. Ltd. 30s.

EUZÉBY, J. (1958). **Diagnostic expérimental des helminthoses animales. Travaux pratiques**

d'helminthologie vétérinaire. [**Veterinary helminthology: systemics of laboratory diagnosis.**] pp. 367. Paris: Vigot Frères.

KÜHN, A. (1959). **Grundriss der allgemeinen Zoologie. [Outline of general zoology.]** pp. vii + 289. Stuttgart: Georg Thieme. 13th edit. Revised and enlarged. DM 17.80.

LAMB, C. A., BENTLEY, O. G. & BEATTIE, J. M. (Edited by) (1958). **Trace elements. Proceedings of the conference held at the Ohio Agricultural Experiment Station, Wooster, Ohio, October 14-16, 1957.** pp. xii + 410. London (& New York): Academic Books Ltd. \$12.00.

LAPAGE, G. (1958). **Parasitic animals.** pp. xxiii + 355. Cambridge: W. Heffer & Sons, Ltd. 2nd edit. 25s.

MARSH, H. (1958). **Newsom's sheep diseases.** pp. xiv + 406. London: Baillière, Tindall & Cox. 2nd edit. 72s.

RIDDELL, R. W. & STEWART, G. T. (1958). **Fungal diseases and their treatment.** pp. xvii + 256. London: Butterworth & Co. 45s.



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## ABBREVIATIONS OF NAMES OF PUBLICATIONS

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